

**UNITED STATES DISTRICT COURT  
DISTRICT OF MASSACHUSETTS**

ENGELHARD CORPORATION,

Plaintiff,

VS.

UNITED STATES OF AMERICA, et al.

Defendants.

Civil Action No.: 05 11241 JLT

**MEMORANDUM IN SUPPORT OF ENGELHARD CORPORATION'S  
MOTION FOR DECLARATORY AND SUMMARY JUDGMENT**

FILED ON BEHALF OF THE PLAINTIFF  
ENGELHARD CORPORATION  
By its attorneys

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Admitted *Pro Hac Vice*

Dated: August 4, 2006

## INTRODUCTION

This case concerns the investigation and cleanup of hazardous substances at a former industrial facility owned by Plaintiff Engelhard Corporation (“Engelhard”) and located in Plainville, Massachusetts (the “Plainville facility”). Engelhard seeks to obtain equitable relief and to recover environmental response costs from the United States of America (“United States”) under various provisions of the Comprehensive Environmental Response, Compensation, and Liability Act (“CERCLA” or more commonly referred to as “Superfund”), 42 U.S.C. §§ 9601-75, and the citizen suit provisions of the Resource Conservation and Recovery Act (“RCRA”), 42 U.S.C. § 6972(a). Engelhard also seeks to recover its cleanup costs pursuant to Federal common law and the Federal Declaratory Judgment Act, 28 U.S.C. §§ 2201-02.

The United States had significant contacts with Engelhard and the Plainville facility starting in the 1950s and continuing through and including the 1990s. These contacts included: (i) providing government-owned radioactive materials for processing and manufacturing at the Plainville facility; (ii) entering into toll manufacturing agreements between Engelhard and the U.S. Mint for the production of coinage stock using government-owned materials; and (iii) specifying procedures for processing and management of government-owned materials. Engelhard alleges that the United States is liable under CERCLA as both an “arranger” and “owner or operator” for the treatment and disposal of hazardous substances at the Plainville facility, as those terms are used in Section 107 of CERCLA, 42 U.S.C. § 9607. Engelhard further alleges that the United States “contributed” to contamination at the Plainville facility, as that term is used in Section 7002 of RCRA, 42 U.S.C. § 6972.

While various motions are presently before the Court with respect to Engelhard’s First, Second, Third, Fifth and Sixth Causes of Action, the instant Motion for Declaratory and Summary Judgment relates only to the Fourth Cause of Action and this Court’s Order of May 9,

2006. Engelhard's Fourth Cause of Action alleges that the United States is liable to Engelhard under CERCLA Section 113(f)(3)(B), 42 U.S.C. § 9613(f)(3)(B), for environmental response costs at the Plainville facility.

At a hearing before the Court on April 26, 2006, the Court characterized the Fourth Cause of Action as a "front burner" issue and asked the parties to clarify this Cause of Action for further review by the Court. Immediately thereafter, Engelhard and the United States jointly provided the Court with a proposed Order, which was subsequently approved and entered into the record by the Court on or about May 9, 2006.

#### **The Court's Order of May 9, 2006**

Pursuant to the Order of this Court dated May 9, 2006 (hereinafter referred to as the "Order of the Court"), both Engelhard and the United States are permitted, if they so choose, to file by no later than July 17, 2006, a motion (either pursuant to Rule 12 or, alternatively, Rule 56 of the Federal Rules of Civil Procedure) directly relating to the viability of Engelhard's Fourth Cause of Action.

As allowed by the Order of the Court, Engelhard has chosen to file such a Motion for Declaratory and Summary Judgment pursuant to Rule 56(a) of the Federal Rules of Civil Procedure.

Rule 56(a) states:

For Claimant. A party seeking to recover upon a claim, counterclaim, or cross-claim or *to obtain a declaratory judgment* may, at any time after the expiration of 20 days from the commencement of the action or after service of a motion for summary judgment by the adverse party, move with or without supporting affidavits for summary judgment in the party's favor upon all or any part thereof. (Emphasis added).

Engelhard is the Claimant under Rule 56(a), seeking to recover upon a justiciable claim against the United States. Engelhard's Motion for Declaratory and Summary Judgment, as circumscribed by Order of the Court and Rule 56(a), is limited to the following two issues:

- a. First Issue: Whether the Administrative Order referred to in Paragraphs 80-82 of the Complaint is an “administrative settlement” within the meaning of Section 113(f)(3)(B) of CERCLA, 42 U.S.C. § 9613(f)(3)(B).
- b. Second Issue: Whether the Fourth Cause of Action [under CERCLA Section 113(f)(3)(B)] is governed by the statute of limitations provided under Section 113(g)(3) of CERCLA, 42 U.S.C. § 9613(g)(3).

See Order of the Court, May 9, 2006.

The Order of the Court restricts the parties to address only these two narrowly defined issues. Engelhard’s Motion for Declaratory and Summary Judgment seeks to have this Court issue a declaratory and summary judgment on both the First and Second Issues. Engelhard asserts that with respect to the First Issue: the Administrative Order referred to in Paragraphs 80-82 is undeniably an “administrative settlement” within the meaning of Section 113(f)(3)(B) of CERCLA. And with respect to the Second Issue: Engelhard’s Fourth Cause of Action is *not* governed by the three-year statute of limitations provided under CERCLA Section 113(g)(3).

### **Summary Of Issues**

Briefly stated, the First Issue listed above relates solely and exclusively to Engelhard’s Fourth Cause of Action. (Nothing in the Order of the Court addresses the other Causes of Action asserted by Engelhard.) The Fourth Cause of Action alleges that the United States is liable to Engelhard for contribution under CERCLA Section 113(f)(3)(B). Section 113(f)(3)(B) provides that:

A person who has resolved its liability to the United States or a State *for some or all of a response action* or for some or all of the costs of such action in an *administrative or judicially approved settlement* may seek contribution from any person who is not party to a settlement referred to in paragraph [113(f)](2). (Emphasis added).

The Administrative Order referred to in Paragraphs 80-82 of the Complaint is, in fact, an

administrative settlement agreement entered into between Engelhard and the U.S. Environmental Protection Agency on September 16, 1993 (hereinafter referred to as the “Administrative Settlement”). With respect to the First Issue of the Order of the Court, Engelhard contends that the Administrative Settlement referred to in Paragraphs 80-82 of the Complaint is also an “administrative settlement” within the meaning of CERCLA Section 113(f)(2), 42 U.S.C. § 9613(f)(2), thereby creating rights of contribution against the United States under Section 113(f)(3)(B) of CERCLA. Section 113(f)(2) states as follows:

A person who has resolved its liability to the United States or a State in an administrative or judicially approved settlement shall not be liable for claims for contribution regarding matters addressed in the settlement. Such settlement does not discharge any of the other potentially liable persons unless its terms so provide, but it reduces the potential liability of the others by the amount of the settlement.

Since CERCLA is utterly silent on the specific form and content of administrative settlements falling within the parameters of Section 113(f)(3)(B), this Court is free to look to the four corners of the Administrative Settlement to determine whether it falls within the intent and meaning of Section 113(f)(3)(B).

Two critical points should be noted regarding the Administrative Settlement. First, the Administrative Settlement states that the remedial work initiated by Engelhard at the Plainville facility was begun voluntarily. In this regard, no enforcement proceedings, penalties, or other sanctions have been pursued against Engelhard before or during the course of the cleanup at the Plainville facility. And while the Administrative Settlement was entered into pursuant to RCRA Section 3008(h), 42 U.S.C. § 6928(h), Engelhard’s voluntary actions initially included the investigation and management of radioactive materials that fall outside the scope of materials regulated under RCRA. *See* 42 U.S.C. § 6903(27). Second, the investigative and cleanup work being performed at Plainville under the Administrative Settlement includes response actions that are identical to the type of “matters addressed” in a CERCLA cleanup. Courts have recognized

that cleanup actions undertaken pursuant to statutes other than CERCLA can satisfy CERCLA's technical requirements. See Mardan Corp. v. C.G.C. Music, Ltd., 600 F.Supp. 1049, 1053 (D.Ariz. 1984), *aff'd*, 804 F.2d 1454 (9<sup>th</sup> Cir. 1986).

With respect to the Second Issue, the plain language of Section 113(g)(3) identifies the limited and narrowly defined instances in which this Section's three-year statute of limitations applies. Section 113(g)(3) states as follows:

No action for contribution for any response costs or damages may be commenced more than 3 years after

(A) the date of judgment in any action under this chapter for recovery of such costs or damages, or

(B) the date of an administrative order under section 9622(g) of this title (relating to de minimis settlements) or 9622(h) of his title (relating to cost recovery settlements) or entry of a judicially approved settlement with respect to such costs or damages.

Simply stated, since none of the specific triggering events identified in Section 113(g)(3)(A) or Section 113(g)(3)(B) have occurred, the Section 113(g)(3) statute of limitations does not and can not apply to the contribution claims found in Engelhard's Fourth Cause of Action. A judicial decision that would add unauthorized triggering events into a statutorily defined limitations period would create grave uncertainty for any future litigation conducted under CERCLA. No court has held otherwise.

Finally, it is important to point out those issues that are *not* addressed by Engelhard's Motion for Declaratory and Summary Judgment. By its Motion for Declaratory and Summary Judgment, Engelhard does not seek to establish the United States' ultimate liability under Engelhard's Fourth Cause of Action, nor does Engelhard attempt to establish liability or to allocate damages or environmental response costs attributable to the United States under any of its other Causes of Action. Material facts relating to the scope and extent of the United States' involvement at Plainville have yet to be brought before the Court. Moreover, discovery has been stayed and only a limited exchange of documents between the parties has been accomplished.

No other discovery has been conducted. As directed by the Court, Engelhard seeks only to establish, by a clear and unambiguous reading of CERCLA and the Administrative Settlement, that (1) the Administrative Settlement is an “administrative settlement” within the meaning of CERCLA Section 113(f)(3)(B) and (2) Engelhard’s Fourth Cause of Action is not governed by the three-year statute of limitations provided in Section 113(g)(3).

### **SUMMARY OF ARGUMENT**

Since the 1986 enactment of the Superfund Amendments and Reauthorization Act, CERCLA has provided a right to cost recovery in certain circumstances (CERCLA Section 107) and separate rights to contribution in other circumstances (CERCLA Section 113(f)(1) and Section 113(f)(3)(B)). See Cooper Industries, Inc. v. Aviall Services Inc., 543 U.S. 157, 125 S. Ct. 577, 160 L.Ed.2d 548 (2004). In Cooper, the Supreme Court held that a private party who has not been the subject of a CERCLA Section 106 order or a Section 107(a) cost recovery action (e.g. a party who has “voluntarily” undertaken a cleanup, as did the plaintiff in Cooper) may not seek contribution from other potentially responsible parties under Section 113(f)(1). The Cooper decision does not, however, affect the right of a private party to obtain contribution under CERCLA Section 113(f)(3)(B). This provision of CERCLA provides a right of contribution to remediating parties who have settled with either the United States or a State, in either a judicial or administrative forum. The plain language of the statute provides for a right of contribution upon the occurrence of three elements: (1) An administrative settlement or a judicially approved settlement; (2) resolution of liability to the United States or a State; and (3) a settlement for some or all of a response action or for some or all of the costs of such action.

Because the Administrative Settlement between Engelhard and the United States is consistent with CERCLA and resolves Engelhard’s liability to the government for matters addressed under the Administrative Settlement, Engelhard can maintain a cause of action under

Section 113(f)(3)(B).

While CERCLA Sections 122(g) and 122(h) provide specific guidance for certain specialized CERCLA settlement agreements, there is no equivalent guidance to State settlements or to other Federal settlements outside the parameters of Section 122(g) and 122(h). The Administrative Settlement between Engelhard and the EPA resolved the EPA's authority to compel Engelhard to take remedial action at the Plainville facility. It further resolved the type and scope of response actions Engelhard would undertake. Since the signing of the Administrative Settlement in 1993, the EPA has taken no further action at the Plainville facility, other than the periodic technical review of the ongoing work performed by Engelhard and its many environmental consultants. The Administrative Settlement covers a "response action" or the "costs of such action" and provides specifically that the purpose of the Administrative Settlement is "to further evaluate the nature and extent of Releases of Hazardous Waste and/or Hazardous Constituents from [Areas of Concern] at the Facility...." Additionally, the work performed by Engelhard under the Administrative Settlement constitutes "response action" as defined by Section 101(23) of CERCLA. 42 U.S.C. § 9601(23). The Administrative Settlement is, therefore, consistent with the terms and purposes of CERCLA generally and with CERCLA Section 113, which are: to achieve the prompt cleanup of hazardous waste sites; to impose the cost of cleanup on those responsible for the contamination; and to maximize the participation of responsible parties and expedite the cleanup by encouraging early settlement, thus reducing the time and expense of enforcement litigation.

Section 113(g)(3) lists four events that trigger the running of the statute of limitations: (1) the entry of a judgment; (2) a Section 122(g) *de minimis* settlement; (3) a Section 122(h) cost recovery settlement; and (4) a judicially approved settlement. Since none of those specific triggering events identified in Section 113(g)(3)(A) or Section 113(g)(3)(B) have occurred at the



Plainville facility, the Section 113(g)(3) statute of limitations does not and can not apply to the contribution claims found in Engelhard's Fourth Cause of Action. The United States Court of Appeals for the First Circuit has examined the highly restricted scope of triggering events found in Section 113(g)(3) and noted that "courts must strive to give effect to each subsection contained in a statute, indeed, to give effect to each word and phrase." United Technologies Corp. v. Browning-Ferris Industries, Inc., 33 F.3d 96, 101 (1<sup>st</sup> Cir. 1994). In American Cyanamid Company, et al. v. Capuano, et al., 381 F.3d 6 (1<sup>st</sup> Cir. 2004), the court examined a judgment in a CERCLA action and concluded that the judgment, while under CERCLA, did not encompass "recovery of such costs and damages" as required in Section 113(g)(3)(A) and the three-year statute of limitations did not apply. The First Circuit's strict reading of Section 113(g)(3) provides clear authority for this Court to rule that the Section 113(g)(3) statute of limitations cannot apply to situations falling outside the statutory parameters.

### **Statement of Facts**

#### **Undisputed Material Facts**

1. Exhibit A, attached hereto, is the Administrative Settlement referred to in Paragraphs 80-82 of the Complaint into between Engelhard and the U.S. Environmental Protection Agency on September 16, 1993.

#### **Factual Background**

Engelhard commenced operations at the Plainville facility in 1957. Between 1957 and 1962, the Plainville facility had two primary functions: rolling and fabricating steel and titanium, and fabricating uranium fuel elements under Atomic Energy Commission licenses. Starting in the mid-1960s and continuing for the next twenty-five years, the Plainville facility produced coin stock and coinage materials for the U.S. Mint. The manufacturing processes included melting the raw metals, mixing with other metals to make alloys, shaping the metal, heat-treating, and

finishing. Wastes produced at various times included wastewater, pollution control dust, and various solid wastes. Because of the toll manufacturing agreements entered into by the United States and Engelhard, and the government's ownership of radioactive and non-radioactive materials processed at Plainville, Engelhard asserts that the United States is potentially liable under both CERCLA and RCRA. See United States v. Aceto Agricultural Chemicals Corp., 872 F.2d 1373 (8<sup>th</sup> Cir. 1989).

On August 13, 1980, Engelhard submitted to the EPA a Notification of Hazardous Waste Activity. In this notification, Engelhard identified itself as a hazardous waste generator and transporter, and the Plainville facility as a hazardous waste treatment, storage, and disposal facility. On November 18, 1980, Engelhard submitted to EPA a Part A Hazardous Waste Permit Application pursuant to Section 3005 of RCRA, 42 U.S.C. § 6925. In this submission, Engelhard identified itself as managing listed and characteristic hazardous wastes at the Plainville facility.

On March 31, 1986, EPA sent Engelhard a request for information pursuant to Section 3007(a) of RCRA, 41 U.S.C. § 6927(a), and Section 104(e) of CERCLA, 42 U.S.C. § 9604(e). Engelhard responded to this information request on September 8, 1986. Engelhard provided supplemental responses to the information request on March 6, 1987 and July 20, 1989.

As stated in the Administrative Settlement, Engelhard *voluntarily* completed a comprehensive investigation of environmental media at the Plainville facility. Administrative Settlement, page 8. "From 1987 to 1990, these [voluntary] activities have included the installation of Monitoring Wells and Sampling of Ground water, soil, soil gas, surface water, sediments, and fish." *Id.* "Two reports concerning Engelhard's voluntary investigations were prepared by Environ Corporation, Engelhard's consultant. These reports, Results of Phase I and Phase II Field Investigation, Engelhard Corporation, Plainville, Massachusetts, dated March 13,

1989, and Phase III Summary Report, Engelhard Corporation, Plainville, Massachusetts, dated March 30, 1990, (“the Environ Reports”) were submitted to EPA, the [Massachusetts Department of Environmental Quality] and the local Board of Health by Engelhard.” Id.

In 1990, the Plainville facility was identified for inclusion in the Nuclear Regulatory Commission’s (“NRC”) Site Decommissioning Management Plan. Engelhard developed a decommissioning plan for contaminated buildings at the Plainville facility; the NRC approved the decommissioning plan in April 1996. Response activities in and around Building 2 were performed in 1996. After Engelhard completed the Building 2 decontamination, the Oak Ridge Institute for Science and Education performed an independent confirmatory survey of certain building areas in January 1997. Portions of affected buildings were released for unrestricted use, with the exception of a tunnel area that Engelhard is presently addressing in its ongoing decommissioning plan for the remainder of the facility. In March 1997, NRC regulatory jurisdiction over the facility was transferred to the Commonwealth of Massachusetts pursuant to Section 247b of the Atomic Energy Act of 1954, as amended, 42 U.S.C. § 2011 et seq., when Massachusetts became an “Agreement State.” At that time, the NRC also removed the Plainville facility from its Site Decommissioning Management Plan. In July 1997, Engelhard submitted a plan to the Commonwealth of Massachusetts describing upcoming decommissioning activities. These decommissioning activities are ongoing.

To date, Engelhard has spent in excess of \$15,000,000 in the investigation and cleanup of the Plainville facility. Major ongoing efforts include a groundwater pump and treat system that both removes contaminants from the groundwater as well as mitigating off-site movement. Engelhard has also remediated significant quantities of radioactive contaminated materials that are stored on site in anticipation of final disposal. Costs will continue to be incurred until final cleanup is achieved.

The undisputed facts demonstrate that pursuant to the Administrative Settlement, Engelhard is conducting an investigation and cleanup to the satisfaction of the Commonwealth of Massachusetts, EPA and NRC, and subject to public comment.

## **ARGUMENT**

### **Standard of Review**

Although discovery has not been completed in this matter, the parties have exchanged a number of relevant documents. However, the Administrative Settlement was mentioned in and appended to the Complaint and therefore may be considered as a part of the pleadings.

Watterson v. Page, 987 F.2d 1, 3 (1<sup>st</sup> Cir.1993). Moreover, the Administrative Settlement is an official public record and the authenticity of the Administrative Settlement has not been disputed. Id.

In seeking a declaratory judgment under Rule 56(a), this Court is guided by the statutory requirements of the Declaratory Judgment Act, which states that “in a case of actual controversy within its jurisdiction, any court of the United States, upon filing of an appropriate pleading, may declare the rights and other legal relations of any interested party seeking such declaration, whether or not further relief is or could be sought. Any such declaration shall have the force and effect of a final judgment or decree and shall be reviewable as such.” 28 U.S.C. § 2201(a). The “actual controversy” must be “definite and concrete, touching the legal relations of the parties having adverse interests.” Aetna Life Ins. Co. of Hartford, Conn. v. Haworth, 300 U.S. 227, 240-241 (1937); see also Lady Deborah, Inc. v. Ware, 855 F.Supp 871, 873 (E.D.Va. 1994) (“Before issuing a declaratory judgment, a district court must find that there is a case or controversy and then must find that declaratory relief is appropriate.”)

In the instant litigation, an “actual controversy” exists with respect to the issues identified in the Order of the Court. Furthermore, declaratory relief is well pled in Engelhard’s Complaint

as the Sixth Cause of Action and as restated in the Order of the Court. Accordingly, this Court has full authority to “declare the rights and other legal relations of any interested party seeking such declaration.” 28 U.S.C. § 2201(a); Rule 56(a).

**First Issue: The Administrative Settlement and Section 113(f)(3)(B)**

The Administrative Settlement between Engelhard and the U.S. Environmental Protection Agency resolves Engelhard’s liability to take remedial action at the Plainville facility. Since 1993, EPA has taken no further regulatory or enforcement action as Engelhard completes the proposed investigation and cleanup. The Administrative Settlement is, therefore, consistent with the terms and purposes of CERCLA generally and with CERCLA Section 113, which are: to achieve the prompt cleanup of hazardous waste sites; to impose the cost of cleanup on those responsible for the contamination through its contribution provisions; to maximize the participation of responsible parties; and to expedite the cleanup by encouraging early settlement, thus reducing the time and expense of enforcement litigation. The Administrative Settlement covers a “response action” or the “costs of such action” and provides specifically that the “mutual objectives” of Engelhard and the EPA “are: to further evaluate the nature and extent of Releases of Hazardous Waste and/or Hazardous Constituents from the [Plainville facility]; to complete a RCRA Facility Investigation; to implement specified measures identified in this [Administrative Settlement] to stabilize Releases of Hazardous Wastes and/or Hazardous Constituents to the environment; to conduct Interim Measures, if necessary; and to gather data to support a future Corrective Measures Study in anticipation that such a study is deemed necessary.” Administrative Settlement, pages 5 and 6.

Under CERCLA, the remediation process at a hazardous waste site is called a response action. 42 U.S.C. § 9601(25). A response action involves removal actions, which “means the cleanup or removal of released hazardous substances from the environment,” 42 U.S.C. §

9601(23), and remedial actions which “means those actions consistent with permanent remedy taken instead of or in addition to removal actions in the event of a release or threatened release of a hazardous substance into the environment,” 42 U.S.C. § 9601(24).

The work mandated under the Administrative Settlement constitutes “response action” as defined by Section 101(23) and Section 101(25) of CERCLA, 42 U.S.C. §§ 9601(23) and (25).

Section 101(25) defines “response” as follows:

The terms “respond” or “response” means [sic] remove, removal, remedy, and remedial action; all such terms (including “removal” and “remedial action”) include enforcement activities related thereto. 42 U.S.C. § 9601(25).

Section 101(23) states in pertinent part as follows:

The terms “remove” or “removal” means [sic] the cleanup or removal of released hazardous substances from the environment, such actions as may be necessary taken in the event of the threat of release of hazardous substances into the environment, such actions as may be necessary to monitor, assess, and evaluate the release or threat of release of hazardous substances, the disposal of removed material, or the taking of such other actions as may be necessary to prevent, minimize, or mitigate damage to the public health or welfare or to the environment, which may otherwise result from a release or threat of release. 42 U.S.C. § 9601(23).

The clear intent of the Administrative Settlement is to set forth Engelhard’s agreement to undertake activities that fall within the definition of the CERCLA term for “response.”

Most importantly, the courts have long accepted the concept that “removal” and “remedial” costs incurred pursuant to other statutes may be subject to recovery or contribution under CERCLA. In United States v. Rohm and Haas Company, 2 F.3d 1265, 1275 (3<sup>rd</sup> Cir. 1993), *rev. on other grounds*, United States v. E.I. DuPont de Nemours and Company, Inc., 432 F.3d 161(3<sup>rd</sup> Cir. 2005), the court noted with approval “that a number of courts have held defendants liable [under CERCLA] for costs of removal or remedial action even where such costs were not incurred pursuant to CERCLA statutory authority.” *Id.* (citations omitted). In Rohm and Haas, the Third Circuit recognized that the broad definitions found in CERCLA for a

“removal” action encompass all forms of investigation and cleanup. “[O]ur conclusion [is] that a removal is a removal whether it is undertaken pursuant to CERCLA or another statute ...” Id.

This interpretation that CERCLA response actions could be undertaken in non-CERCLA cleanup activities was supported recently in Seneca Meadows, Inc. v. ECI Liquidating, Inc., 2006 WL 1030321 (W.D.N.Y. April 20, 2006). The District Court in Seneca Meadows held that state-level “Consent Orders” qualified as an “administrative settlement” for the purposes of obtaining contribution under CERCLA section 113(f)(3)(B). Even though the State of New York had never received “delegated” authority under CERCLA from the EPA, the District Court concluded that Seneca Meadows had “resolved” its liability to the State under the three Consent Orders signed with New York Department of Environmental Conservation.

CERCLA does not limit or otherwise restrict the flexibility granted to the Federal government or the states to fashion appropriate administrative settlements. While CERCLA Section 122 provides specific guidance for CERCLA settlement agreements entered by the United States, there is no equivalent guidance with respect to state settlements or non-CERCLA agreements that contain “matters addressed” equivalent to a CERCLA-quality cleanup. Because the Administrative Settlement is consistent with CERCLA’s statutory definitions and objectives, and resolved Engelhard’s liability to the EPA for “some or all” of the response actions incurred at the Plainville facility, the Administrative Settlement satisfies the stated requirements of Section 113(f)(3)(B).

Recent judicial decisions have examined the boundaries of administrative settlements that satisfy the requirements of Section 113(f)(3)(B). In Pharmacia Corp. v. Clayton Chem. Acquisition LLC, 382 F.Supp. 2d 1079 (S.D. Ill. 2005), the plaintiffs who cleaned up the site subject to two administrative orders issued by the EPA argued that the Administrative Order on Consent (“AOC”) was an administrative settlement pursuant to CERCLA Section 122(d)(3).

The plaintiffs argued that the AOC resolved its liability to the United States under an administrative settlement and therefore were entitled to bring an action for contribution under Section 113(f)(3)(B). The court disagreed with the plaintiffs. The court said that the orders were issued pursuant to Section 106 of CERCLA as explicitly noted in the caption of the AOC, not Section 122(a), the authority for settlements under CERCLA. In addition, the penalty and enforcement provisions cited were both under Section 106, not Section 122. Id. at 1087. The court concluded that the “AOC at issue is exactly what it says it is, an administrative order, not an administrative settlement giving rise to a right of contribution pursuant to Section 113(f)(3)(B).” Id. The court went on to find that the administrative order did not qualify as a “civil action” and therefore the plaintiff’s Section 113(f)(1) claim was also precluded. But unlike the situation at Plainville, there was no indication that the plaintiff in Pharmacia undertook any investigative or remedial actions voluntarily.

In City of Waukesha v. Viacom International Inc., 362 F.Supp. 2d 1025 (E.D.Wis. 2005), the City was not permitted to amend its complaint to include a CERCLA Section 113(f)(3)(B) claim because it had not yet reached an agreement with the Wisconsin Department of Natural Resources. The City submitted an *unsigned* agreement with WDNR and the court noted, “the City submitted a letter from a WDNR representative who wrote, ‘DNR and the City are in agreement regarding the basic terms, but we are working on some of the details regarding the Agreement.’” Id. at 1027. The court’s holding in City of Waukesha is distinguishable from the instant matter in which a detailed settlement agreement has been reached between Engelhard and the EPA.

Similarly, in Asarco v. Union Pacific, a Memorandum of Agreement with the Nebraska Department of Environmental Quality was deemed not to be an administrative settlement under Section 113(f)(3)(B). The agreement required the potentially responsible party to conduct its



remediation under applicable state laws and regulations with oversight by the Nebraska Department of Environmental Quality. The court found that if Section 113(f)(3)(B) required the settlement to resolve CERCLA liability, the Memorandum of Agreement failed because it did not meet the requirements of Section 122.

The Plainville facility is representative of a situation found at industrial facilities across the country: an industrial facility, contaminated by historic operations, that is now being remediated pursuant to RCRA. This group of facilities, including the Plainville facility, consists of more than 6,500 active or formerly active industrial facilities that manage, or formerly managed, hazardous wastes. *See* <http://www.epa.gov/epaoswer/hazwaste/ca/backgnd.htm#4> (last updated February 22, 2006). The cleanup of industrial sites is typically implemented either through RCRA permits or through RCRA administrative orders on consent. The RCRA permits and administrative orders are generally issued to the current site owners by the EPA or delegated state environmental agencies. Such orders may be issued under Sections 3008(h) or 3013 of RCRA. 42 U.S.C. §§ 6928(h), 6934.

Site owners, like Engelhard, performing cleanups under RCRA often seek equitable contribution from other potentially responsible parties under CERCLA. In fact, the United States has championed the use of CERCLA to recover costs incurred at RCRA cleanup sites. Rohm and Haas, at 1272-75. In Rohm and Haas, the United States sought to recover under Section 107 of CERCLA, 42 U.S.C. § 9607, governmental oversight costs incurred in the cleanup of a site subject to an Administrative Consent Order issued under Section 3008(h) of RCRA, 42 U.S.C. § 6928(h). Section 3008(h) is the same RCRA provision under which Engelhard and the United States entered into the Administrative Settlement at the Plainville facility. The Administrative Consent Order in Rohm and Haas provided that the property owner would perform various cleanup related activities on all portions of the site. The United States

subsequently brought an action under Section 107 of CERCLA attempting to recover from the property owner and other defendants all removal costs incurred by the government in connection with the site, including oversight costs incurred by the government under RCRA. Clearly, if the United States argues that it has a right under CERCLA to recover administrative oversight costs for sites remediated under RCRA authority, then property owners who resolve their liability under RCRA for response costs should have the same rights of recovery or contribution under CERCLA against other potentially responsible parties.

### **Second Issue: Statute of Limitations**

The Second Issue to be addressed pursuant to the Court's Order of May 9, 2006, is "Whether the Fourth Cause of Action is governed by the statute of limitations provided under Section 113(g)(3) of CERCLA, 42 U.S.C. § 9613(g)(3)." Section 113(g)(3) has the title "Contribution" and states as follows:

No action for contribution for any response costs or damages may be commenced more than 3 years after

- (A) the date of judgment in any action under this chapter for recovery of such costs or damages, or
- (B) the date of an administrative order under section 9622(g) of this title (relating to de minimis settlements) or 9622(h) of this title (relating to cost recovery settlements) or entry of a judicially approved settlement with respect to such costs or damages.

Based solely on the title of Section 113(g)(3), it might be assumed that a contribution claim under Section 113(f)(3)(B) would fall under the limitations period of Section 113(g)(3). However, this assumption is incorrect. Section 113(g)(3) does not address *all* possible rights of contribution. Because of this statutory omission, courts have interpreted the statute as a whole to establish limitation periods for other CERCLA contribution actions.

The Supreme Court has provided guidance in dicta on the CERCLA statute of limitations. Justice Thomas writing for the majority, stated: "[Section] 113 provides two express avenues for contribution: [section] 113(f)(1) (during or following specified court actions) and [section]

113(f)(3)(B) (after an administrative or judicially approved settlement that resolves liability to the United States or a State.)” Cooper, 543 U.S. at 167. Following the above observation, Justice Thomas went on to note the corresponding three-year statutes of limitations for contribution actions set forth in Section 113(g)(3). One begins at the date of judgment, the others at the date of an administrative order under either CERCLA Section 122(g) or Section 122(h).

Importantly, none of the triggering events in Section 113(g)(3) applies to the Administrative Settlement or to the causes of action asserted by Engelhard. Engelhard has not been subject to a judgment nor has it entered either an administrative order under 122(g) or (h) or a judicially approved settlement for such costs. Indeed, the Administrative Settlement entered into by Engelhard resolves liability for response actions not the costs of such action.

CERCLA contains several statutes of limitations. 42 U.S.C. § 9613(g)(2)(A) (three year statute after completion of a removal action); 42 U.S.C. § 9613(g)(2)(B) (six-year statute for initial action for recovery of remedial costs referred to in Section 107(a), triggered by beginning of physical on-site construction); 42 U.S.C. § 9613(g)(3) (three-year period for contribution action, with three alternative triggering events: a prior judgment, specified administrative orders, or a judicially approved settlement).

Whether a party is seeking recovery or contribution under Section 107(a) or contribution under section 113 is not determinative of the applicable statute of limitations. Justice Thomas continued his analysis of the CERCLA statutes of limitations: “[n]otably absent from [section] 113(g)(3) is any provision for starting the limitations period if a judgment or settlement never occurs, as is the case with a purely voluntary cleanup.” Cooper, 543 U.S. at 167. He then concluded that this “lack of such a provision supports the conclusion that, to assert a contribution claim under [Section] 113(f), a party must satisfy the conditions of either [Section] 113(f)(1) or

[Section] 113(f)(3)(B).” Id. (Left undecided by the Supreme Court were the issues of whether a contribution action could be brought under Section 107 and what the statute of limitations would be for such a Section 107 cause of action. Id. at 169). Although not explicitly held by the Court, “administrative settlements” under section 113(g)(3), i.e. agreements reached under sections 122(g) or 122(h), are the only types of settlements explicitly referenced in the three-year statute of limitations. All other settlements, such as settlements with a State or RCRA settlements of the type entered into by Engelhard, create a right of contribution under a different statute of limitations. See Consolidated Edison v. UGI Utilities, Inc., 423 F.3d 90, 104, n. 14 (2<sup>nd</sup> Cir. 2005) (holding that a right of contribution exists under Section 107, recognizing also the “voluntariness” of costs that Con Ed has incurred prior to entering into a Voluntary Cleanup Agreement with the State of New York). Since the Supreme Court’s decision in Cooper, Consolidated Edison is the only appellate court so far to address the availability of a right of contribution under Section 107. Finding such a right of contribution under Section 107 for a “voluntary” cleanup suggests that the three-year statute of limitations of Section 113(g)(3) simply does not apply to voluntary cleanups where none of the Section 113(g)(3) triggering events has occurred.

Not only are there other types of administrative settlements pursuant to State law or other Federal authority, but Section 122 itself contemplates CERCLA settlements beyond those governed by Sections 122(g) and 122(h), and does not explicitly identify any of these as “administrative settlements.” Indeed, subsection (d) of Section 122, entitled “Enforcement,” specifically includes a provision relative to agreements under CERCLA section 104(b). Subsection 122(d)(3) provides the authority under which the EPA may issue orders under Section 104(b) and may establish the obligations of parties to cleanups. Moreover, (d)(3) explicitly vests the government with the ability to enforce such orders. Orders under Section

122(d)(3), as well as those issued under Sections 122(g) and 122(h), clearly emanate from the same general settlement authority provided for in section 122(a). Finally, while not requiring adherence to the more rigid publication and notice and comment protocols set forth in Section 122(i), settlements under CERCLA section 104 are statutorily required to comply with the special notice procedures of Section 122(e). Although Section 122 includes CERCLA settlements of various forms and types, only Section 122(g) and 122(h) fall within the limitation period Section 113(g)(3). Failure to include these other Section 122 settlements, as well as voluntary cleanups, in the scope of Section 113(g)(3) means that the limitations period must be found elsewhere, if a limitation period exists at all.

CERCLA Section 113(f)(3)(B) ensures that resolution of liability with a State, in addition to the Federal government, either by a judicially approved or an administrative settlement enables a party to bring a contribution claim for cleanup costs. This is true despite the fact that the statute of limitations relative to CERCLA contribution actions does not indicate what event triggers the limitations period in the event of a State settlement. Moreover, case law supports that State settlements may serve as grounds for CERCLA contribution claims, and therefore must qualify as “administrative settlements” under Section 113(f)(3)(B). See, e.g., Pfohl Bros. Landfill Steering Comm. v. Allied Waste Sys., Inc., 255 F.Supp 2d 134 (W.D.N.Y 2003).

It seems highly unlikely, even improbable, that Congress would intend to allow parties resolving liability under State administrative settlements to seek contribution from other potentially responsible parties while limiting the ability of parties resolving liability under Federal administrative settlements from doing so. And, if so intended, that it would not explicitly state this distinction.

Finally, it should be noted that the Administrative Settlement at the Plainville facility states specifically that remedial work performed by Engelhard at the Plainville facility was

initially conducted voluntarily. Because of Justice Thomas' observations regarding the absence of "voluntary" cleanups from the statute of limitations for CERCLA, the Supreme Court's decision in Cooper creates some uncertainty regarding the appropriate statute of limitations to be applied for contribution claims that fall outside the specific instances described in Section 113(g)(3). Compare Gould Inc. v. A&M Battery and Tire Serv., 901 F.Supp. 906, 913-15 (M.D.Pa. 1995) and Reichhold Chem. Inc. v. Textron, Inc., 888 F.Supp. 1116, 1121-25 (N.D.Fla. 1995) (there is no limitations period for voluntary cleanups or cleanups under state administrative settlements) with Sun Co. v. Browning Ferris, Inc., 124 F.3d 1187, 1193 (finding that the appropriate statute of limitations for a voluntary remediation is six years after initiation of physical on-site construction of the remedial action as provided in 42 U.S.C. § 113(g)(2)(B), borrowing the logic from the Ninth Circuit opinion in Pinal Creek Group v. Newmont Mining Corp., 118 F.3d 1298 (9<sup>th</sup> Cir. 1997)); see also Rumpke of Indiana, Inc. v. Cummins Engine Co., Inc., 107 F.3d 1235 (7<sup>th</sup> Cir. 1997) (holding that, in cases where the three-year time limit is impossible to trigger, parties will never be time barred from claiming contribution). Because Cooper did not specifically address this point, the courts will continue to fashion reasonable interpretations of limitation periods for situations not specifically addressed by the statute. In Geraghty and Miller, Inc. v. Conoco, 234 F.3d 917 (5<sup>th</sup> Cir. 2000), the court stated plainly the difficulty sometimes arising under CERCLA:

Whether a party is seeking recovery under section 107(a) or contribution under section 113 does not always determine the applicable statute of limitations. In cases such as this one where a party seeks contribution but none of the triggering events has occurred, Congress did not designate the statute of limitations. Id. at 924.

The court in Geraghty and Miller recognized that there are three possible approaches to determining the appropriate statute of limitations where there is no clear triggering event:

There are three basic approaches to the issue ... Under the first approach, we would find that the plain language of section 113(g)(3) establishes no

statute of limitations for this case. Under the second, we would use the six-year statute of limitations in section 113(g)(2), for reasons explained below. Under the third, we would use the three-year statute of limitations in section 113(g)(3) and import another triggering event from federal common law. We conclude that the Tenth's Circuit's reasoning in favor of the second approach in Sun Co. v. Browning-Ferris, Inc., 124 F.3d 1187 (10<sup>th</sup> Cir. 1997), is the most persuasive. In Sun Co., the Tenth Circuit analyzes the statutory framework and applies it in a practical way. Its rationale begins with the explanation that while section 113(f) is the vehicle for bringing a contribution action, it does not create a new cause of action or create any new liabilities. Rather, it is a mechanism for apportioning costs that are recoverable under section 107. In other words, a section 113 contribution action is a claim for collection of the costs referred to in section 107. By definition, the Tenth Circuit reasons, a contribution action is merely one type of cost-recovery action. If there has been no prior section 107 cost-recovery action, a contribution action becomes an "initial action for recovery of the costs referred to in section 9607 of this title," and must be brought "within 6 years after initiation of physical on-site construction of the remedial action. (quoting 42 U.S.C. § 9613(g)(2)(B))." Geraghty and Miller at 924-25. (citations omitted).

In United Technologies, the First Circuit addressed the issue of the appropriate statute of limitations under CERCLA for environmental response costs incurred under a judicially approved consent decree. The Court determined that Section 113(g)(3)(B) applies in that situation. 42 U.S.C. § 9613(g)(3)(B) (providing that the accrual period for contribution actions begins when a "judicially approved settlement" is entered). United Technologies at 98. Unlike United Technologies, where the plaintiffs were subject to a CERCLA civil action filed by the United States, Engelhard has not entered into a "judicially approved settlement." In fact, the Administrative Settlement between Engelhard and the United States references the "voluntary" environmental response actions undertaken by Engelhard.

CERCLA was crafted to grant the Federal government and the states discretion to settle with liable parties to cleanup contaminated property. The goal is a cleaner environment through efficient and effective remediation. CERCLA Section 122 offers *optional* guidance regarding settlements between EPA and potentially responsible parties, and outlines liability releases that the government may offer as part of settlement. However, there are no mandatory guidelines

that demand and specify the form of an administrative settlement. Accordingly, since none of Section 113(g)(3) circumstances apply to the instant matter, the Court must look elsewhere in CERCLA to find the appropriate limitations period. In American Cyanamid Co. v. Capuano, 381 F.3d 6 (1<sup>st</sup> Cir. 2004), the First Circuit chose not to expand the triggering events of Section 113(g)(3), holding instead that a strict reading of Section 113(g)(3) dictated its interpretation of the CERCLA statute of limitations. American Cyanamid provides clear authority for this Court to rule that the three-year statute of limitations of Section 113(g)(3) cannot apply to Engelhard's Fourth Cause of Action or to any situation falling outside the specified triggering events.

### CONCLUSION

The Order of the Court requires that the parties examine two issues related to Engelhard's Fourth Cause of Action. First, whether the Administrative Settlement entered in by Engelhard and the U.S. Environmental Protection Agency was an "administrative settlement" within the meaning of Section 113(f)(3)(B). And second, whether the statute of limitations found at Section 113(g)(3) controls contribution claims under Section 113(f)(3)(B).

Engelhard has shown that CERCLA provides no restrictions or limitations on the types of "administrative settlements" that fall within the meaning of Section 113(f)(3)(B). Accordingly, the Administrative Settlement between Engelhard and the EPA falls within the meaning of Section 113(f)(3)(B) because "some or all" aspects of a "response" action under CERCLA are resolved by the actions contemplated by the Administrative Settlement. Furthermore, the statute of limitations found at Section 113(g)(3) unambiguously specifies narrowly defined circumstances for the imposition of a three-year limitation period. None of the circumstances mentioned in Section 113(g)(3) have occurred at the Plainville facility. Hence, the three-year limitation period of Section 113(g)(3) does not apply to Engelhard's CERCLA claims against the United States.



**REQUEST FOR ORAL ARGUMENT**

Pursuant to Local Rule 7.1(D), Engelhard respectfully requests the opportunity for oral argument before the Court.

FILED ON BEHALF OF THE PLAINTIFF  
ENGELHARD CORPORATION  
By its attorneys

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Dated August 4, 2006

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Dated: August 4, 2006

**UNITED STATES DISTRICT COURT  
DISTRICT OF MASSACHUSETTS**

ENGELHARD CORPORATION,

Plaintiff,

VS.

UNITED STATES OF AMERICA, et. al.

Defendants.

Civil Action No.: 05 11241 JLT

**(PROPOSED) ORDER**

Upon consideration of the Plaintiff Engelhard Corporation's Motion for Declaratory and Summary Judgment and the United States' Memorandum in Opposition, the Court being fully advised of the issues raised, this \_\_\_\_ day of \_\_\_\_\_, 2006, hereby ORDERED that Engelhard's Motion for Declaratory and Summary Judgment is GRANTED. Pursuant to the Order of the Court dated May 9, 2006, Declaratory and Summary Judgment is GRANTED as follows:

First Issue: The Administrative Order referred to in Paragraphs 80-82 of Engelhard’s Complaint is an “administrative settlement” within the meaning of Section 113(f)(3)(B) of CERCLA, 42 U.S.C. § 9613(f)(3)(B).

**Second Issue:** The Fourth Cause of Action in Engelhard's Complaint is not governed by the statute of limitations provided under Section 113(g)(3) of CERCLA, 42 U.S.C. § 9613(g)(3).

Dated:\_\_\_\_\_

The Honorable Joseph L. Tauro  
United States District Judge

**CERTIFICATE OF SERVICE**

I HEREBY CERTIFY that I have this 4<sup>th</sup> day of August 2006, served a true and correct copy of the foregoing,

- 1) MEMORANDUM IN SUPPORT OF ENGELHARD CORPORATION'S MOTION FOR DECLARATORY AND SUMMARY JUDGMENT
- 2) PROPOSED ORDER

on Defendant's counsel of record by electronic filing, as follows:

Stephen E. Crowley, Esquire  
U.S. Department of Justice  
Environmental Defense Section  
P. O. Box 23986  
Washington, DC 20026-3986  
Tele: (202) 514-0165  
Fax: (202) 514-8865  
[Stephen.Crowley@usdoj.gov](mailto:Stephen.Crowley@usdoj.gov)

By: /s/ Paul R. Mastrocola  
Paul R. Mastrocola  
Attorney for Plaintiff  
Engelhard Corporation



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION I

J.F. KENNEDY FEDERAL BUILDING, BOSTON, MASSACHUSETTS 02203-2211

September 9, 1993

Linda D'Amore  
Regional Hearing Clerk  
U.S. Environmental Protection Agency  
Region I  
J.F. Kennedy Federal Building, RCG  
Boston, Massachusetts 02203

Re: Engelhard Corporation; Docket No. I-92-1051

Dear Ms. D'Amore:

Enclosed for filing in the above-referenced matter, please find a signed Consent Order and a Certificate of Service.

Thank you for your assistance.

Very truly yours,

*Andrea Simpson*  
Andrea Simpson  
Assistant Regional Counsel

Enclosure

cc: Robert A. DiBiccaro, Presiding Officer  
Lois R. Murphy, Esq.  
Donald Anglehart, Esq.





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION I

J.F. KENNEDY FEDERAL BUILDING, BOSTON, MASSACHUSETTS 02203-2211

CERTIFIED MAIL

September 9, 1993

Lois R. Murphy  
Cahill Gordon and Reindel  
Eighty Pine Street  
New York, New York 10005

Re: Engelhard Corporation; RCRA Docket No. I-92-1051

Dear Lois:

Enclosed please find a copy of the Consent Order which was signed by the Acting Regional Administrator today and filed with the Regional Hearing Clerk. Pursuant to Section XIII. of the Consent Order, Engelhard must notify EPA of its designated Project Coordinator within seven days of today's date. Pursuant to Section I. of the Consent Order, the Stabilization Plan is due within 90 days of today's date.

Please call me if you have any questions concerning the Consent Order.

Very truly yours,

*Andrea Simpson*  
Andrea Simpson  
Assistant Regional Counsel

cc: Bob Brackett

RECEIVED BY  
THOMAS S. BROWN

SEP 16 1993

COPIES TO:

CIRC. TO:

RETURN

FILE: 01-Plainville - Soil/GW

14-101



RCRA DOCKET NO: I-92-1051

**CONSENT ORDER**

EPA I.D. #MAD001190644

The authority to issue this Consent Order is vested in the Administrator of the United States Environmental Protection Agency ("EPA") under RCRA and has been delegated to the Regional Administrators by EPA Delegation No. 8-31, dated March 6, 1986. This authority has been further delegated by the Regional Administrator for Region I to the Director of the Waste Management Division ("Director") on September 29, 1988. For purposes of this Consent Order only, Engelhard consents to the jurisdiction of EPA to issue this Consent Order.

RCRA Docket No. I-92-1051

Certificate of Service

I hereby certify that the original Consent Order was served upon the Regional Hearing Clerk and copies thereof were served upon the Presiding Officer and Counsel for the Respondent, this day, in the following manner and at the addresses listed below:

Original by hand delivery to: Linda D'Amore  
Acting Regional Hearing Clerk  
U.S. Environmental Protection  
Agency  
Region I  
J.F.K. Federal Building, RCG  
Boston, Massachusetts 02203

Copy by hand delivery to: Robert A. DiBiccaro  
Presiding Officer  
U.S. Environmental Protection  
Agency  
Region I  
J.F.K. Federal Building, RRC  
Boston, Massachusetts 02203

Copy by certified mail to: Lois R. Murphy  
Cahill Gordon & Reindel  
Eighty Pine Street  
New York, New York 10005

Copy by first class mail to: Donald L. Anglehart  
Testa Hurwitz & Thibault  
53 State Street  
Boston, Massachusetts 02109

Date: 8/9/93

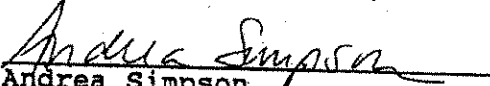
  
Andrea Simpson  
Assistant Regional Counsel

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Figure 1: Facility Boundary and Building Plan

Figure 2: Locations of Areas and sub-Areas of Concern

Figure 3: Area of Ground-Water Stabilization Measure

Figure 4: Area of Fence Relocation Stabilization Measure

Attachment I: AOCs and Media to be Investigated

Attachment II: Technical Agreement

Attachment III: Legal Description of Facility Boundary

Appendix I - Information Requirements of the RFI Proposal for  
the Environmental Setting, Source and  
Contamination Characterization

Appendix II - Information Requirements of the RFI Proposal for  
the Sampling and Analysis Program

Appendix III - Health and Environmental Risk Assessment

DEFINITIONS

All terms used in this Consent Order are as defined in 40 C.F.R. Sections 260.10 and 264.141, unless defined below:

1. "Act" or "RCRA" means the Resource Conservation and Recovery Act, as amended by the Hazardous and Solid Waste Amendments of 1984, 42 U.S.C. §§ 6901 et seq.
2. "Appendix IX" means Appendix IX to 40 C.F.R. Part 264, as amended. See 52 Fed. Reg. 25942 (July 9, 1987) (Final Rule).
3. "Aquifer" means a geological formation, group of geological formations, or part of a geological formation that is capable of yielding water to water supply wells or springs.
4. "Area of Concern" or "sub-Area of Concern" means an area at the Facility where solid or Hazardous Waste or Hazardous Constituents may have been managed or may have come to be located and from which releases of Hazardous Waste or Hazardous Constituents have or may have occurred. Examples include, without limitation: landfills, surface impoundments, waste piles, storage tanks, incinerators, tanks (including 90-day accumulation tanks), container storage areas, waste water treatment units, and waste recycling operations.
5. "Background" for any particular media (Ground Water, soil, surface water and sediments, and/or air) shall mean a representative nearby sample of that media that is upgradient of any Zone(s) of Contamination and/or is not

affected by the Facility.

6. "Constituents of Concern" means those constituents listed in Appendix VIII to 40 C.F.R. Part 261 or in Appendix IX to 40 C.F.R. Part 264 which have been or may have been released from AOCs or sub-AOCs at the Facility.
7. "Day" means a calendar day unless otherwise stated.
8. "Director" means the Director of the Waste Management Division, EPA Region I or his designee. For purposes of Section XXX, Director means the Director or Acting Director of the Waste Management Division, EPA, Region I.
9. "Facility" (see "Site") includes all contiguous land owned by Engelhard Corporation west of Route 152 in Plainville, Massachusetts, and structures, other appurtenances and improvements on the land, not limited to solid or Hazardous Waste management areas used for treating, storing, or disposing of Hazardous Waste, as shown on Figure 1 and described in Attachment III.
10. "Ground Water" (or "ground-water") means water below the land surface in the subsurface zone below which all pore space is filled with water.
11. "Hazardous Constituents" are those constituents listed in Appendix VIII to 40 C.F.R. Part 261 or in Appendix IX to 40 C.F.R. Part 264.
12. "Hazardous Waste" is as defined in Section 1004(5) of RCRA, 42 U.S.C. § 6903(5).

13. "Health-Based Criteria" shall refer to those health-based standards that, in order of preference, have been either promulgated by EPA in regulation form, adopted by EPA in guidance form, or deemed acceptable by the Director.
14. "Monitoring Well" means a well capable of producing ground-water samples that, upon laboratory analysis, can provide a reliable indication of ground-water quality.
15. "Observation Well" means a well used to measure ground-water table elevations.
16. "Point of Exposure" means the point at which a potential receptor can come into contact, either now or in the future, with Hazardous Waste and/or Hazardous Constituents.
17. "Release" includes any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment.
18. "Site" (see "Facility") includes all contiguous land owned by Engelhard Corporation west of Route 152 in Plainville, Massachusetts, and structures, other appurtenances and improvements on the land, not limited to solid or Hazardous Waste management areas used for treating, storing, or disposing of Hazardous Waste, as shown on Figure 1 and described in Attachment III.
19. "Stabilization" means a national management strategy which stresses the control or abatement of threats to human health and the environment from Releases of Hazardous Wastes or Hazardous Constituents at RCRA facilities, or prevents or

minimizes the further spread of contamination while long term remedies are pursued.

20. "Water Quality Standards" are provisions of State or Federal law which consist of a designated use or uses for the waters of the United States and water quality criteria for such waters based upon such uses. Water quality standards are established to protect the public health or welfare, enhance the quality of water and serve the purposes of the Clean Water Act ("CWA").
21. "Zone of Contamination" means the three dimensional extent of contamination that was produced or is being produced from a Release of Hazardous Wastes or Hazardous Constituents from an Area of Concern or sub-Area of Concern.

APPLICABILITY

1. This Consent Order applies to and is binding upon Engelhard Corporation, its successors and assigns.
2. No change in ownership or corporate status will in any way alter Engelhard's responsibility under this Consent Order.
3. Engelhard agrees to provide a copy of this Consent Order to all contractors and consultants retained to conduct or monitor any portion of the work performed pursuant to this Consent Order prior to the date that work, pursuant to this Consent Order, is to begin. Engelhard or its contractors or consultants shall provide written notice of this Consent Order to all subcontractors hired to perform any portion of the work required by this Consent Order prior to the commencement of work by such subcontractors. Engelhard shall be responsible for ensuring that its contractors and subcontractors perform the work contemplated herein in accordance with this Consent Order.
4. Engelhard agrees to give notice of this Consent Order to any successor in interest prior to transfer of ownership or operation of the Facility, and agrees to notify EPA in writing of such transfer of ownership or operation at least thirty (30) days prior to such action.

STATEMENT OF PURPOSE

In entering into this Consent Order, the mutual objectives of the parties are: to further evaluate the nature and extent of Releases of Hazardous Waste and/or Hazardous Constituents from



AOCs at the Facility; to complete a RCRA Facility Investigation; to implement specified measures identified in this Consent Order to stabilize Releases of Hazardous Wastes and/or Hazardous Constituents to the environment; to conduct Interim Measures, if necessary; and to gather data to support a future Corrective Measures Study in anticipation that such a study is deemed necessary.

#### FINDINGS

1. Engelhard Corporation is incorporated under the laws of the State of Delaware.
2. Engelhard owns and operates a Facility located in Plainville, Massachusetts.
3. Engelhard's Facility commenced operations in 1957. Between 1957 and 1962, the plant had two primary functions: rolling and fabricating steel and titanium, and fabricating uranium fuel elements under Atomic Energy Commission licenses. The Facility has, at various times until recently, manufactured precious metals into wire and flatstock, primarily for the jewelry and electrical industries. The manufacturing processes have included melting the raw metals, mixing with other metals to make alloys, shaping the metal, heat treating, and finishing. Wastes generated at various times as a result of these processes included: waste water containing cyanide, chromium, and/or acid/alkaline waste streams; solvents; pollution control dust; and metal hydroxide sludge.

4. Engelhard owned and operated the Facility on and after November 19, 1980, the applicable date which renders facilities subject to interim status requirements or the requirement to have a permit under Sections 3004 and 3005 of RCRA, 42 U.S.C. § 6924 and § 6925, and 40 C.F.R. Parts 265, 268 and 270.
5. Pursuant to Section 3010(a) of RCRA, 42 U.S.C. § 6930(a), Engelhard submitted to EPA a Notification of Hazardous Waste Activity dated August 13, 1980. In this notification, Engelhard identified itself as a Hazardous Waste generator and transporter, and a Hazardous Waste treatment, storage, and disposal ("TSD") facility.
6. On November 18, 1980, Engelhard submitted to EPA a Part A Hazardous Waste Permit Application pursuant to Section 3005 of RCRA, 42 U.S.C. § 6925, and the regulations promulgated thereunder, 40 C.F.R. § 270.10(e)(1). In this submission, Engelhard identified itself as managing listed and characteristic Hazardous Wastes at the Facility.
7. Engelhard requested and was granted a change of status by the Massachusetts Department of Environmental Protection ("DEP") from a TSD facility to a Large Quantity Generator on April 19, 1989.
8. On March 31, 1986, EPA sent Engelhard a Request for Information pursuant to Section 3007(a) of RCRA, 42 U.S.C. § 6927(a), and Section 104(e) of CERCLA, 42 U.S.C. § 9604(e) ("Information Request").

9. Engelhard responded to the Information Request on September 8, 1986. The Company provided supplemental responses to the Information Request on March 6, 1987 and July 20, 1989.
10. Engelhard has voluntarily completed three phases of Site investigation. From 1987 to 1990, these activities have included the installation of Monitoring Wells and sampling of Ground Water, soil, soil gas, surface water, sediments and fish.
11. Two reports concerning Engelhard's voluntary investigations were prepared by Environ Corporation, Engelhard's consultant. These reports, Results of Phase I and Phase II Field Investigation, Engelhard Corporation, Plainville, Massachusetts, dated March 13, 1989, and Phase III Summary Report, Engelhard Corporation, Plainville, Massachusetts, dated March 30, 1990, ("the Environ Reports") were submitted to EPA, the DEP and the local Board of Health by Engelhard.
12. Based on the information submitted in responses to the Section 3007(a) Information Request, the Environ Reports and information gathered by EPA, forty-six (46) Areas of Concern ("AOCs") were identified by EPA at the Facility and are listed in the September 1991 RCRA Facility Assessment ("RFA") prepared by EPA.
13. EPA and Engelhard agree, for the purpose of this Consent Order, that Engelhard shall conduct further investigation of twenty (20) of the original forty-six (46) AOCs.

14. EPA and Engelhard agree to reclassify certain AOCs as sub-AOCs. These AOCs are proximate to each other, share the same potential remedial issues and are areas at which similar wastes were managed. Accordingly, two new AOCs, AOC A and AOC B, are composed of sub-AOCs as follows:

AOCs #1 and #12 are reclassified as sub-AOCs A-1 and A-12. Sub-AOCs A-1 and A-12 are combined to form a new AOC: AOC-A.

AOCs #2, #3, #4, #18, and #35 are reclassified as sub-AOCs B-2, B-3, B-4, B-18, and B-35. These sub-AOCs are combined to form a new AOC: AOC-B.

Based on this reclassification of AOCs, EPA and Engelhard agree that Engelhard shall conduct further investigations for the following fifteen (15) AOCs:

AOC-A (composed of sub-AOCs A-1 and A-12), AOC-B (composed of sub-AOCs B-2, B-3, B-4, B-18, and B-35), AOC #5, AOC #6, AOC #7, AOC #13, AOC #14, AOC #16, AOC #19, AOC #22, AOC #23, AOC #26, AOC #29, AOC #30, and AOC #44.

15. A brief description and dates of operation of the AOCs and sub-AOCs to be investigated are set forth below in numerical sequence by AOC number. The locations of these AOCs and sub-AOCs are set out on a map of the Site attached to this Consent Order as Figure 2.

#### 15.1 Sub-AOC A-1

Sub-AOC A-1 is an area located west of Building #8 where untreated process wastewaters, wastewater processed through the water treatment plant, regenerate waste, and cyanide wastewaters were released to pits and to the ground surface. Portions of Sub-AOC A-1 are located beneath the 100,000 gallon equalization tank and lined lagoon, and Building #10. This Sub-AOC was in use sometime after startup of the wastewater treatment operation in 1973 until replacement of the initial treatment facility in 1981.

#### 15.2 Sub-AOC B-2

Sub-AOC B-2 is an area located south of Building #6. This Sub-AOC was used from 1973 to 1984, and received Releases containing metal sludge and wastewater associated with a wet scrubber system and Releases from Sub-AOC B-18. The wet scrubber system was replaced in 1984 by a baghouse system.

#### 15.3 Sub-AOC B-3

Sub-AOC B-3 is an area or leach field which is located south of Building #6. This sub-AOC was first used for operations in Building #6, constructed in 1966. Discharges to this sub-AOC ceased in 1976. Waste streams containing wastewaters from trenches in a melt room and blowdown from boilers were discharged onto the ground surface and/or the leach field.

15.4 Sub-AOC B-4

Sub-AOC B-4 is an area located south of Building #3 which was used from 1973 to 1984. Metal sludge and wastewater were released onto the ground surface from two (2) wet scrubbers. The wet scrubbers were replaced by baghouses in 1984.

15.5 AOC #5

AOC #5 is an area, pit or pond located beneath the northwest corner of what is now Building #8. This area was first used by operations in Buildings #5 and #6 constructed in 1966. Discharges to this area ceased in 1972. Cooling, annealing and acid cleaning wastewaters contaminated with metals were discharged onto the ground. AOC #5 also includes an area where an above floor degreaser was operated in Building #8, directly overlapping the area described above. Building #8 was constructed in 1972.

15.6 AOC #6

AOC #6 is an area located under the southwest corner of what is now Building #8. This area was first used by operations in Buildings #5 and #6, constructed in 1966. Discharges to AOC #6 ceased in 1972. Wastewaters from metal cleaning operations were released onto the ground.

15.7 AOC #7

AOC #7 was used as an outdoor waste storage area from sometime after the Facility began operations in 1957 until 1983. This AOC is located in the vicinity of Buildings #9 and #12. Waste oils, chlorinated solvents, corrosive wastes,

and scrubber and wastewater treatment sludges were stored in various types of containers, including drums. In 1960, cooling water from the Nuclear Division was disposed of in the courtyard. To alleviate a problem of ponding and rusting of barrels containing metal scrap, a trench was dug in 1960 to carry the water across the yard to Turnpike Lake. Prior to 1972, the area was graded to allow drainage to the Lake. Prior to 1972, oils from drums were observed by Facility personnel draining toward the Lake.

#### 15.8 Sub-AOC A-12

Sub-AOC A-12 is a former waste storage area that was used from sometime after the wastewater treatment facility began operations in 1972 until 1980. This sub-AOC is located beneath what is now the north end of Building #10. The area was used for the above-ground storage of wastes in containers including spent carbon, spent resins and spent filter sand from the wastewater treatment plant, waste acids and alkalis, and waste oils. One 1,000 gallon above-ground tank was used to store waste oil, and one 4,000 gallon underground concrete tank was used for storing regenerate wastes. The 4,000 gallon underground storage tank was removed prior to construction of the north end addition to Building #10.

#### 15.9 AOC #13

AOC #13 consists of the surface waters of Turnpike Lake and the near shore sediments and shoreline of Turnpike Lake which abut the Facility. Releases of Hazardous Wastes and/or

Hazardous Constituents to the Lake or Lake shoreline have occurred from AOCs at the Facility. Roof drains from Buildings #1, #2, #5, #6, #7, and #9 discharged to the south embayment of Turnpike Lake and stormwater discharges from the roof drains contained heavy metals.

15.10 AOC #14

AOC #14 is an area located under what is now Building #8. This area was used from sometime after Building #5 was constructed in 1966 until 1972. Wastewater from various metal cleaning operations was discharged into a leachfield.

15.11 AOC #16

AOC #16 consists of a wastewater disposal system which is comprised of two cesspits and an associated leachfield, which were used from 1957 to 1976. At various times, this AOC received wastewaters from the wire melt room, personnel cleanup wastes from a locker room, wastes from an assay laboratory, and treated wastewaters generated during the fabrication of uranium fuel elements.

15.12 Sub-AOC B-18

Sub-AOC B-18 is an underground storage tank located south of Buildings #6 and #7 which was constructed in 1976 and is still in use. The 1,000 gallon tank is used to collect cooling tower bleed-off, scrubber bleed-off, boiler blowdown and contact cooling wastewaters for direct pumping to the wastewater treatment plant. The tank has overflowed in the past in the area identified as Sub-AOC B-2 and entered



Turnpike Lake. Pumps and pipes were replaced in 1981 to prevent any such Releases.

15.13 AOC #19

AOC #19 is a small building adjoining Building #7 set approximately four feet below ground level. The building contains a grease trap which treats contact cooling water generated by the rolling mill. A sump pump located in the building discharged water contaminated with oil (and potentially with metals) to the ground surface outside the building wall.

15.14 AOC #22

AOC #22 is a dry well located under the northeast corner of Building #9 which was used from sometime after the Facility began operations in 1957 until 1977. The dry well received unknown quantities of steam condensate from a sump containing two (2) steam-heated vapor degreasers. Halogenated solvent residues may have been present in this condensate. AOC #22 is a potential source of volatile organic compounds found in Ground Water.

15.15 AOC #23

AOC #23 consists of an operational storm drain and leachfield which is located north of Building #1. Engelhard's records do not indicate when the storm drain and leachfield were constructed. Currently, the AOC receives runoff from a paved area. At one time it received floor spillage from the lower boiler room in Building #1 which included spillage from a

process wastewater tank located in the area.

15.16 AOC #26

AOC #26 consists of a 22-foot long by 2-foot wide concrete trench which served as a housing for process piping in Building #1. In 1989, Engelhard employees reported that wastewater had leaked from this piping and trench. The piping connected aqueous acid/alkali cleaning tanks with a drain that leads to the wastewater treatment system.

15.17 AOC #29

AOC #29 consists of a former above-floor degreaser located in Building #8 in the north central portion of the Facility. Building #8 was constructed in 1972.

15.18 AOC #30

AOC #30 consists of a former degreaser pit located in the floor of Building #6. Building #6 was constructed in 1966. The degreaser is a potential source of volatile organic compounds found in soil gas in this area.

15.19 Sub-AOC B-35

Sub-AOC B-35 is a non-operational dust collector located on a concrete pad at the southwest corner outside of Building #7. This dust collector may have been a source of Release of metals to soils.

15.20 AOC #44

AOC #44 is an unlined storm water basin located northwest of Building #10. The basin receives storm water from the roof of Building #8, constructed in 1972.

16. Therefore, EPA believes there is a need to obtain further information to identify and evaluate the nature and extent of Releases of Hazardous Wastes and/or Hazardous Constituents from the AOCs and sub-AOCs identified above, to identify and assess any adverse environmental and/or public health effects at the Facility and off-site, to implement specific Stabilization measures as described herein and to implement other interim measures, if necessary.

#### DETERMINATIONS

The Determinations set forth below are those of EPA only. Based upon the contents of the Administrative Record and the aforementioned information contained in the Findings above, EPA has determined, pursuant to Section 3008(h) of RCRA, that:

1. Engelhard is a "person" within the meaning of Section 1004(15) of RCRA, 42 U.S.C. § 6903(15).
2. Engelhard owns and operates the Facility.
3. The Facility was authorized, at all times relevant to this Consent Order, to operate under Section 3005(e) of Subtitle C of RCRA, 42 U.S.C. § 6925(e), and Massachusetts General Laws ch. 21C.
4. Some of the waste streams generated from manufacturing processes at the Facility were hazardous as defined in Section 1004(5) of RCRA, 42 U.S.C. § 6903(5).
5. The methods and practices of Hazardous Waste management employed by Engelhard at the Facility have resulted in Releases of Hazardous Waste and Hazardous Constituents into

the environment.

6. Hazardous Wastes and/or Hazardous Constituents which have been released at the Facility have migrated and may still be migrating to the Ground Water, soils, surface waters and sediments at or in the vicinity of the Facility. Therefore, EPA has determined that further investigation of these media should be conducted.
7. The response measures to be conducted by Engelhard pursuant to this Consent Order are necessary for the purpose of protecting human health and the environment.

CONSENT AGREEMENT

1. EPA and Engelhard have agreed to enter into this Consent Order in settlement of this matter without adjudication of any issue of fact or law.
2. For purposes of this Consent Order and any action to enforce the terms of this Consent Order, Engelhard admits to the jurisdiction of EPA to require the actions agreed to herein under the authority of RCRA, 42 U.S.C. § 6901 et seq.
3. EPA and Engelhard agree that the Findings and requirements of this Consent Order, and any actions taken pursuant hereto, do not constitute any admission of fact or law or liability by Engelhard as to any issue raised, except that Engelhard agrees that this Consent Order shall be admissible as evidence in any proceeding brought by EPA to enforce the terms and requirements of this Consent Order.

4. Engelhard agrees to comply with the terms of this Consent Order.
5. Engelhard waives its right to a hearing on any issue of fact or law or requirements set forth in this Consent Order. Engelhard also waives its right to challenge any decisions made by the Director pursuant to this Consent Order, except as provided in the Dispute Resolution Section below, or as provided by applicable law.
6. Based upon the information known by EPA at the time of the signing of this Consent Order, EPA and Engelhard agree that further investigation of the AOCs listed in the RFA, but not specifically identified herein, is not necessary. However, if, at any time, EPA, Engelhard or its contractors obtains or becomes aware of any new or additional information concerning Releases or threatened Releases of Hazardous Waste and/or Hazardous Constituents at or from any of the AOCs which are not currently being investigated pursuant to this Consent Order, EPA may require further investigation of those AOCs. In addition, Engelhard agrees to investigate any previously unidentified AOCs which are identified pursuant to this Consent Order and which require investigation, as determined by EPA.

I. STABILIZATION PLAN

Introduction

Within ninety (90) days after the effective date of this Consent Order, Engelhard shall submit a Stabilization Plan

to EPA for its review. The Stabilization Plan shall specifically set out the manner in which Engelhard will implement Stabilization measures to stabilize Releases of Hazardous Wastes and/or Hazardous Constituents from AOCs at the Facility.

Stabilization measures shall be designed to meet the general and specific performance standards listed in and approved pursuant to Section I.A. below, and should be, to the extent possible, consistent and integrable with any anticipated long-term remedies. EPA reserves the right to determine whether the general Stabilization performance standards listed in Section I.A. below, or the specific performance standards approved by EPA pursuant to Section I.A. below, may be approved as final media protection standards. EPA may, in its discretion, approve those Stabilization measures which have been successfully implemented as satisfying the requirements for a final remedy.

The Stabilization Plan shall identify each specific Stabilization measure which Engelhard will implement to Stabilize Releases of Hazardous Wastes and/or Hazardous Constituents from AOCs at the Facility, pursuant to Section I.A. below. The Stabilization Plan shall include proposed specific performance standards for the required Stabilization measures listed under Sections I.A.1, I.A.2,

and I.A.3 below. The Stabilization Plan shall include a Stabilization Measures Work Plan and a Stabilization Management Plan, as described in Sections I.B. and I.C., below.

EPA will review all Stabilization documents submitted by Engelhard. EPA will review, in accordance with the procedures set forth in Section XXVII below, all schedules, performance standards, and Stabilization reports. EPA may disapprove, request modifications to or additional information for, but will not approve, Stabilization Measures Work Plans, Conceptual Designs, Operation and Maintenance Plans, Final Designs, and Confirmatory Sampling Plans for Stabilization measures.

Should EPA determine that any Stabilization measure which has been implemented or completed has not achieved the general performance standards listed in Section I.A. or specific performance standards approved pursuant to Section I.A of this Consent Order, EPA may require Engelhard to conduct additional Stabilization measures. Engelhard shall conduct all Stabilization measures in accordance with the Data Collection Quality Assurance Plan and Data Management Plan, as approved by EPA under Section V (RCRA Facility Investigation Proposal) of this Consent Order, and shall comply with all health and safety measures, pursuant to

Section V. Engelhard shall identify in the Stabilization Plan and shall obtain all federal, state, and local permits necessary to implement Stabilization actions, and shall provide EPA with copies of all applications and correspondence regarding these permits.

The Stabilization Plan shall include the following:

A. Required Stabilization Measures

The Stabilization Plan shall include plans to implement Stabilization measures to meet the performance standards and stabilize the AOCs listed below:

1. Soils at AOC B.

Engelhard shall implement Stabilization measures to achieve the following general performance standards in paragraphs a. and b. below, and the specific performance standards approved by EPA pursuant to paragraphs c. and d. below:

- a. Engelhard shall remove and/or treat contaminated soils located in the southern portion of the Facility in the vicinity of AOC B which could pose a threat to current or future workers at the Site based on an exposure scenario consistent with industrial use and based on applicable EPA standard exposure factors guidance.
- b. Engelhard shall remove, treat and/or isolate



by capping contaminated soils located in the southern portion of the Facility in the vicinity of AOC B that pose a threat to human health or the environment by migration of Hazardous Wastes and/or Hazardous Constituents to off-site areas, consistent with an off-site exposure scenario of residential use and based on applicable EPA standard exposure factors guidance.

- c. Engelhard shall develop and submit to EPA for approval proposed specific performance standards as follows: concentrations of Constituents of Concern in soils which, when exceeded, trigger removal and/or treatment of the soils. The development of concentrations of Constituents of Concern which trigger removal and/or treatment of soils shall be based on a consideration of all potential exposure pathways. This may include ingestion, inhalation, and dermal exposures which occur as a result of contact with soils associated with on-site activities by workers, including Site maintenance, consistent with industrial use.
- d. Engelhard shall develop and submit to EPA for approval proposed specific performance

standards as follows: concentrations of Constituents of Concern in soils which, when exceeded, trigger removal, treatment and/or on-site isolation by capping. The development of concentrations of Constituents of Concern which trigger removal, treatment and/or on-site capping will be based on consideration of appropriate exposure pathways, including:

- i. The potential for concentrations of Constituents of Concern in runoff to exceed applicable surface Water Quality Standards or, if standards are not available, levels that are protective of human health and the environment in surface water bodies, including fish ingestion;
- ii. The potential for migration of Constituents of Concern from soils to ground-water zones that may cause exceedance of standards applicable to ground-water quality, or if standards are not available, levels protective of human health and the environment, at the Facility boundary; and
- iii. The potential for human health impacts

from airborne transport of dust to off-site areas.

2. Roof drain runoff at AOC #13

- a. Engelhard shall implement Stabilization Measures to achieve the following general performance standard:

Engelhard shall eliminate the continued discharge of roof drain runoff contaminated with Hazardous Wastes and/or Hazardous Constituents from the Facility to AOC #13 at concentrations which exceed applicable Water Quality Standards, or if standards are not available, levels protective of human health and the environment.

- b. Engelhard shall implement Stabilization Measures to achieve the following specific performance standard:

Engelhard shall develop and submit to EPA for approval proposed specific performance standards (permissible storm water discharge concentrations) for the Constituents of Concern in storm water. These specific performance standards will be developed consistent with requirements of the National Pollutant Discharge Elimination System ("NPDES") Storm Water Discharge Permit

Program as codified in 40 C.F.R. Part 122 and any applicable state requirements.

3. Contaminated Ground Water migrating from the Facility.

Engelhard shall implement Stabilization measures to achieve the following two (2) general performance standards listed in paragraphs a. and b. below, and the specific performance standards approved by EPA pursuant to paragraph c. below:

- a. Engelhard shall design, install, operate, monitor, and maintain a ground-water pump and treat system that utilizes pumping wells to significantly reduce migration of contaminated Ground Water off-site by causing a reversal of the natural hydraulic gradient in the bedrock and overlying unconsolidated saturated zones along an approximately 540 foot line which shall extend from line A-A' to line B-B' shown on Figure 3.
- b. Engelhard shall treat recovered Ground Water to the extent necessary to comply with applicable discharge standards.
- c. Engelhard shall develop and submit to EPA for approval proposed specific performance standards (permissible discharge concentrations) for the treated Ground Water. These specific performance standards shall be

protective of human health and the environment and shall be developed based on the following considerations, as appropriate:

- i. Federal and state surface Water Quality Standards, if treated water is discharged to surface waters;
- ii. Standards applicable to ground-water quality, as promulgated in 40 C.F.R. § 264.94, and the national revised primary drinking water regulations maximum contaminant levels, as promulgated in 40 C.F.R. § 141.60, if treated water is reinjected to the Aquifer;
- iii. Wastewater industrial pretreatment requirements, if treated water is discharged to a Publicly Owned Treatment Works.

4. Public access at AOC #13.

Engelhard shall implement Stabilization measures to achieve the following two (2) general performance standards:

- a. Engelhard shall restrict access onto the Facility property from Turnpike Lake by installing a fence along the shoreline of Turnpike Lake, at the locations depicted in

Figure 4.

- b. Engelhard shall post "No Trespassing" signs on this fence at 100 foot intervals.

B. Stabilization Measures Work Plan

The Stabilization Measures Work Plan shall include the following:

1. For each Stabilization measure listed in Section I.A. above, identify the specific Stabilization measure(s) which shall be used to achieve the general and specific performance standards for Stabilization. For each specific Stabilization measure identified, Engelhard shall describe the procedures and methods to be followed including all treatment and/or disposal work, specifying the method(s) of chemical, thermal, and/or physical treatment, and transportation. Any anticipated off-site storage and disposal facilities shall also be identified. In addition, Engelhard shall identify any anticipated federal, state and/or local permits necessary for the implementation of Stabilization activities.
2. For each specific Stabilization measure identified pursuant to Section I.B.1. above, Engelhard shall summarize all existing data which Engelhard used in its analysis to select the specific Stabilization measure.

3. For each specific Stabilization measure identified pursuant to Section I.B.1. above, Engelhard shall explain the reasons for selecting the specific Stabilization measure.
4. Engelhard shall identify any additional data necessary to design the specific Stabilization measures identified pursuant to Section I.B.1. above, and include a plan for collecting the necessary data. The plan shall specify sampling locations, include a list of parameters for which analyses will be performed, any testing or analytical methodologies to be employed, and a schedule for completion.
5. For each specific Stabilization measure identified pursuant to Section I.B.1. above, Engelhard shall identify negative impacts to human health and the environment which reasonably may occur during, or as a result of, the implementation of the specific Stabilization measure, and any proposed measures designed to prevent these impacts from occurring.
6. For each specific Stabilization measure identified pursuant to Section I.B.1. above, Engelhard shall describe the manner in which the Site will be left after the specific Stabilization measure is completed (i.e. vegetation to minimize runoff of soils, backfilling excavations, and other actions

that minimize physical hazards such as holes or uneven terrain).

C. Stabilization Management Plan

The Stabilization Plan shall include a Stabilization Management Plan which proposes schedules for implementation of specific Stabilization measures identified pursuant to Section I.B. and provides for monthly progress reports regarding Stabilization activities during the period that Stabilization is ongoing. After specific Stabilization measures have been implemented, Engelhard may propose to EPA, in writing, to reduce the frequency of required progress reports.

EPA will review the Stabilization Management Plan in accordance with the procedures set forth in Section XXVII of this Consent Order.

The Stabilization Management Plan shall include the following information:

1. Proposed Schedules

- a. The Stabilization Management Plan shall include proposed schedules for implementation of each specific Stabilization measure identified pursuant to Section I.B.1. above. Schedules for each specific Stabilization



measure shall include the following:

- i. A schedule for submittal of additional data to EPA;
  - ii. A schedule for submittal of the Conceptual Design to EPA;
  - iii. A schedule for submittal of applications for federal, state and local permits necessary for implementation of the specific Stabilization measure;
  - iv. A schedule for submittal of a Final Design to EPA;
  - v. A schedule for implementation of the specific Stabilization measure;
  - vi. A schedule for the projected achievement of the performance standard(s); and
  - vii. A schedule for submittal of the Stabilization Report to EPA.
- b. The Stabilization Management Plan shall include an explanation as to how the proposed schedules set out timeframes designed to perform all necessary tasks as expeditiously as possible. The schedules submitted above shall take into account public comment periods, if any, required by the Massachusetts DEP Public Involvement Plan.

2. Progress Reports

- a. Beginning the month following the approval and/or receipt of EPA's comments on the Stabilization Plan until receipt of EPA's final comments on the Final Design for Stabilization measures, Engelhard shall provide EPA with written bimonthly progress reports by the fifteenth (15th) day of each alternate month, in accordance with the schedules approved by EPA.
- b. During the intervening months, Engelhard shall initiate a conference call with EPA at an agreed upon day and time. Progress will be reviewed and issues which have arisen will be discussed. The written progress reports will be consolidated with the progress reporting requirements of the RFI to the extent possible.
- c. If, due to scheduling problems, sickness, or for any other reason, a conference call does not occur during a month in which a written progress report is not scheduled to be submitted, Engelhard agrees to submit a written progress report for that month, which includes the information set forth in paragraph e. below, by the fifteenth (15th)

day of the following month.

- d. Beginning the month following the receipt of EPA's comments on the Final Design for Stabilization Measures, Engelhard shall provide EPA with monthly progress reports on Stabilization activities by the fifteenth (15th) day of each month. After Stabilization Measures have been implemented, Engelhard may propose to EPA in writing to reduce the frequency of required progress reports.
- e. The written progress reports shall include:
  - i. A description of all Stabilization-related tasks completed during the reporting period;
  - ii. A description of all planned Stabilization-related tasks not completed during that reporting period and an explanation as to why the tasks were not completed;
  - iii. All validated results of sampling, tests, hydraulic head measurements, and all other relevant data generated or received by Engelhard during the reporting period. After the Stabilization ground-water containment/

treatment system has been installed and tested, Engelhard shall provide maps which accurately depict the hydraulic gradients around and between any pumping wells and the capture zones produced by the aggregate of pumping wells.

Engelhard shall map and evaluate the potentiometric data from Monitoring/Observation Wells in order to demonstrate whether the system has achieved the applicable performance standard;

- iv. A description of problem areas and anticipated problem areas that may arise in the following two (2) months in complying with this Consent Order, and how Engelhard proposes to overcome these problems;
- v. A projection of Stabilization-related tasks to be performed during the following two (2) month period, with proposed schedules;
- vi. An explanation of and justification, if any, for any deviation from the approved schedule and a justification for a proposed modification of the schedule;

and

- vii. An evaluation, if appropriate, of whether the general performance standards listed in Section I.A. and the specific performance standards approved by EPA pursuant to Section I.A. have been or are being met.

II. CONCEPTUAL DESIGNS, CONFIRMATORY SAMPLING PLANS AND

OPERATION AND MAINTENANCE PLANS FOR STABILIZATION MEASURES

Engelhard shall submit a Conceptual Design, a Confirmatory Sampling Plan and an Operation and Maintenance Plan for each specific Stabilization measure identified pursuant to Section I.B.1. above. For specific Stabilization measures which, in the opinion of Engelhard, do not require additional data for design or feasibility assessment, Engelhard shall propose a schedule for submitting the Conceptual Designs, Confirmatory Sampling Plans and Operation and Maintenance Plans. In no event shall this schedule allow for more than three (3) months for submittal of the Conceptual Designs, Confirmatory Sampling Plans and Operation and Maintenance Plans after receipt of Stabilization Plan comments from EPA. For specific Stabilization measures which, in the opinion of Engelhard, require additional data for design or feasibility assessment, Engelhard shall propose a schedule for acquiring and submitting such validated data and submitting the

Conceptual Designs, Confirmatory Sampling Plans and Operation and Maintenance Plans to EPA. In no event shall this schedule allow more than three (3) months for submission of the Conceptual Designs, Confirmatory Sampling Plans and Operation and Maintenance Plans after submission of the necessary data to EPA.

A. Conceptual Designs

The Conceptual Design for each specific Stabilization measure shall provide for the protection of human health and the environment and shall take into account all applicable federal, state and/or local environmental and public health laws, regulations and standards during implementation of the Stabilization measures. EPA will comment on, but will not approve Conceptual Designs.

The Conceptual Design shall consist of the following, as appropriate:

1. A description of the design strategy and the design basis;
2. A description of the technical factors used for developing the design. Engelhard shall include all assumptions and a detailed explanation of these assumptions;
3. Conceptual design drawings and diagrams which illustrate the impact of the proposed system on the affected media, and showing areas of

influence, cross-sectional diagrams, ground-water table, etc;

4. Applicable engineering calculations for design;
5. A description of the possible areas of uncertainty and possible operation and maintenance issues (e.g., fouling, weather);
6. A description of any measures necessary to minimize impacts to human health and the environment and to take into account applicable federal, state and local environmental and public health laws, and regulations and standards during implementation of the specific Stabilization measures;
7. A description of the measures Engelhard shall take to continue to meet the applicable performance standards during periods in which the system is shut down due to minor system failure and/or preventative maintenance;
8. Identification of any anticipated off-site storage and/or disposal facilities; and
9. Identification of any federal, state, and/or local approvals and/or permits necessary for the implementation of Stabilization activities.

B. Confirmatory Sampling Plan

The Confirmatory Sampling Plan shall provide the means for determining whether or not a Stabilization activity

has achieved the applicable performance standards. EPA shall determine that a Stabilization measure has been successfully implemented when Engelhard provides adequate documentation, pursuant to Section IV, below, that the approved performance standards have been or are being met. The Confirmatory Sampling Plan shall include the following:

1. **Soils at AOC B.** A plan to collect data to demonstrate that the remaining soils meet the applicable performance standards listed in and approved pursuant to Section I.A. above. The plan must provide for gridding and sampling of the remaining soils, as appropriate, and verification of the locations, concentrations, and delineation of the extent of contamination in the remaining soils;
2. **Roof drain runoff at AOC #13.** A plan to collect data to demonstrate that the completed Stabilization measure has met the applicable performance standards listed in and approved pursuant to Section I.A. above. The plan must include sampling of roof drain storm water at the points of discharge to AOC #13 during a rain event;
3. **Contaminated Ground Water migrating from the Facility boundary.** A plan to collect data to



verify that the applicable performance standards listed in and approved pursuant to Section I.A. above, have been met. The plan shall provide for the following:

- a. Installation of a sufficient number of Monitoring Wells and/or Observation Wells to demonstrate the extent of hydraulic containment. If reinjection of the treated Ground Water is chosen as a discharge method, Engelhard shall design and construct adequate arrays of Observation Wells to measure and map the hydraulic gradients within the bedrock and overburden zones and between the bedrock and overburden zones and areas of influence in the Ground Water affected by the ground-water collection system;
- b. A ground-water monitoring program in the saturated unconsolidated and consolidated deposits. The program shall include monthly hydraulic head measurements, and quarterly collection and analysis of ground-water samples from an adequate number of wells to document trends in water quality. After six (6) months of hydraulic head measurements and two (2) quarterly sampling events, Engelhard may request in writing that EPA modify the

schedule for hydraulic head measurements and collection and analysis of ground-water samples;

- c. A program for monitoring the Stabilization ground-water treatment system influent and effluent flow rate and influent and effluent contaminant concentrations that is protective of human health and the environment and addresses the requirements of any applicable discharge permit(s).

- 4. The Confirmatory Sampling Plan shall specify the parameters for which analyses will be performed and the analytical methodologies to be employed.

C. Operation and Maintenance Plans

Engelhard shall prepare and submit a preliminary Operation and Maintenance ("O&M") Plan for each specific Stabilization measure, as appropriate, to cover both implementation and long term maintenance of the specific Stabilization measure. Preliminary O&M Plans shall be submitted with Conceptual Designs. Each O&M Plan shall be composed of the following elements, as appropriate:

- 1. Equipment start-up and operator training.  
Engelhard shall prepare the technical specifications governing treatment systems, including contractor requirements for

installation, adjustment, startup and servicing of the treatment systems, and training covering operational procedures.

2. Description of normal O & M including the following:
  - a. Description of tasks necessary for operation;
  - b. Description of tasks necessary for maintenance;
  - c. Description of prescribed treatment or operation conditions; and
  - d. Schedule showing frequency of each O&M task to be performed.
3. Description of routine monitoring and laboratory testing including the following:
  - a. Description of monitoring tasks;
  - b. Description of required laboratory tests and their interpretation;
  - c. Required QA/QC;
  - d. Schedule of monitoring frequency and when monitoring may cease; and
  - e. Data validation procedures.
4. Description of equipment including the following:
  - a. Equipment identification;
  - b. Laboratory records;
  - c. Mechanism for reporting emergencies; and
  - d. Personnel and maintenance records.

**III. FINAL DESIGNS AND IMPLEMENTATION OF STABILIZATION MEASURES**

A. Engelhard shall submit a Final Design for each specific Stabilization measure in accordance with the approved schedule. In no event shall this schedule allow more than three (3) months to submit the Final Design following receipt of comments on the Conceptual Design from EPA. EPA will comment on but will not approve Final Designs for specific Stabilization measures. The Final Design documents shall consist of the Final Design plans and specifications and the final O&M plans.

B. Engelhard shall begin construction of the Stabilization measures within sixty (60) days following receipt of EPA comments on the Final Design plans and receipt of all applicable permits. Operation of specific Stabilization measures shall begin in accordance with the approved schedule. Operation of specific Stabilization measures shall begin no later than one hundred fifty (150) days after Engelhard receives EPA comments on the Final Design plans.

**IV. STABILIZATION REPORTS**

Engelhard shall submit a Stabilization Report for each Stabilization measure within one hundred twenty (120) days after the completion of the final field tasks of the Stabilization measure. In the case of the ground-water pump and treat system and any other Stabilization measure which

will require ongoing O & M and confirmatory sampling, Engelhard shall submit the Stabilization Report within one hundred twenty (120) days after the system begins operating.

The Stabilization Reports shall provide an overview of each Stabilization activity completed at the Site. The Stabilization Reports shall include the following:

- A. For each Stabilization measure conducted, a summary of the tasks performed with a detailed description of any changes to the original work plan.
- B. For each Stabilization measure conducted, a description of the results of the confirmatory sampling, as appropriate, including:
  1. A summary of validated data collected pursuant to the Stabilization measure. Include Site maps that delineate residual contamination concentrations and provide tabular summaries of validated data generated;
  2. An evaluation of the effectiveness of the Stabilization measures in achieving the applicable performance standards; and
  3. All validated analytical reports (including QA/QC data if requested by EPA) generated from samples taken during confirmatory sampling.

EPA may require Engelhard to submit and implement a plan to conduct additional sampling if the confirmatory sampling data has not adequately demonstrated whether or not the applicable performance standard has been achieved.

- C. A copy of the most legible copy available of all Hazardous Waste and radioactive waste manifests or any similar shipping documents, including any manifest or shipping document showing the signature of the receiving facility, of any such waste transported off-Site pursuant to this Consent Order, and documentation, as appropriate, which certifies the final disposition of any such material shipped off-site.
- D. For each specific Stabilization measure conducted, describe how the Site was left after the specific Stabilization measure was completed (i.e. vegetation to minimize runoff of soils, backfilling excavations, etc.).

V. RCRA FACILITY INVESTIGATION ("RFI") PROPOSAL

Within one hundred twenty (120) days after the effective date of this Consent Order, Engelhard shall submit to EPA a RCRA Facility Investigation ("RFI") Proposal. A preliminary scope of certain aspects of the field investigations which will be conducted by Engelhard has been agreed to by EPA and Engelhard and is incorporated into this Consent Order as Attachment II. The RFI Proposal shall detail the

methodology for determining the nature, rate (if applicable) and extent of Releases of Hazardous Waste from the AOCs and sub-AOCs listed in Attachment I and as located in Figure 2, into Ground Water, soils, surface water, and sediments. The specific media that shall be addressed for each AOC and sub-AOC are set out in Attachment I. The methodology also shall be designed to gather the preliminary information potentially necessary to select and design corrective measures to address Releases of Hazardous Waste and/or Hazardous Constituents from the AOCs and sub-AOCs listed in Attachment I. The RFI proposal shall include the following:

A. Current Assessment Summary Report

The RFI Proposal shall contain a Current Assessment Summary Report based on all existing past or current data, including the Environ Reports previously submitted, and other information that is available to Engelhard. The Current Assessment Summary Report shall include the following:

1. A history and description of solid and Hazardous Waste generation, treatment, storage and disposal activities conducted at the Facility. This history shall include the active dates, where reasonably known or estimable after diligent inquiry, of the AOCs and sub-AOCs listed in Attachment I, and an identification of the types and amounts of all materials spilled or deposited.

therein, where reasonably known or estimable after diligent inquiry.

2. An analysis of the climatological, topographic and hydrogeological features of the Site including:
  - a. The annual and monthly precipitation averages for the preceding thirty (30) years;
  - b. The monthly temperature averages and extremes for the preceding thirty (30) years;
  - c. A wind rose for monthly and annual wind direction for the last five (5) years; and
  - d. A description of any topographic and/or man-made features that may affect air flow or water flow and emission patterns at the Facility.
3. An analysis of the direction and rate of ground-water flow through the Site, including recent overburden and bedrock ground-water contour maps.
4. A description of the Zones of Contamination of Hazardous Waste and/or Hazardous Constituents released from AOCs and sub-AOCs at the Facility. The description shall be based on available monitoring data and qualitative information on locations and contaminant levels. Engelhard shall include a description of the sampling methodologies, including quality assurance and quality control (QA/QC) procedures used to



generate and validate all quantitative data.

Engelhard also shall describe, based on available information, whether the Releases potentially could have entered the Ground Water, soils, air, or surface water and sediments of Turnpike Lake adjacent to the Facility and the unnamed streams and wetlands in the vicinity of the Site.

5. A description and evaluation of all actions taken to date to mitigate the potential effects on human health or the environment caused by Releases of Hazardous Wastes and/or Hazardous Constituents from AOCs and sub-AOCs at the Facility.
6. A description and evaluation of the current performance of existing Observation Wells and Monitoring Wells (i.e., design, screen length, well logs, well development, etc.) in use.
7. Historic topographic maps and historic photography of the Facility in Engelhard's possession. If the historic maps are not of a scale which clearly depicts the information required, Engelhard shall use these maps to generate new ones that are of such a scale. The scale shall be clearly stated for all maps, and shall be consistent and appropriate for all newly generated maps. All newly generated maps shall be of sufficient detail and accuracy to locate and report all current and

future work performed at the Site. Maps shall be included which identify the following:

- a. General geographic location of the Facility;
  - b. Property lines, with the owners of all adjacent property clearly indicated;
  - c. Topography, waterways, wetlands, flood plains, water features, drainage patterns, storm drainage system;
  - d. Tanks, buildings, utilities, paved areas, easements, right-of-ways and wells;
  - e. All solid or Hazardous Waste treatment, storage or disposal areas active after November 19, 1980;
  - f. All known past solid or Hazardous Waste treatment, storage or disposal areas regardless of whether they were active after November 19, 1980;
  - g. Surrounding land use (residential, commercial, agricultural, recreational); and
  - h. Existing Observation Wells and Monitoring Wells.
8. Historic photography of the Facility need only be included to the extent that it may bear on the investigations required under this Consent Order.
  9. A description of the adequacy of existing data and identification of additional data needs to satisfy

the objectives of the RFI. This assessment shall describe additional data needed within the scope of the RFI. Any data from prior sampling that is not used in this assessment shall be identified, and the reason(s) for omitting such data shall be explained.

**B. Identification of Additional Media of Concern and Areas of Concern:**

**1. Additional Media of Concern**

If Engelhard identifies any additional media of concern for the AOCs and/or sub-AOCs listed in Attachment I, the RFI Proposal shall include a proposed modification to Attachment I indicating that new media of concern have been identified for the specified AOCs and/or sub-AOCs. Upon addition to the Attachment, the newly identified media of concern shall be investigated for each specified AOC and/or sub-AOC.

**2. Additional Areas of Concern**

a. If Engelhard identifies any additional AOCs at the Facility, Engelhard shall submit to EPA the following information for each such AOC:

- i. Characteristics, including size, volume, and other physical characteristics;
- ii. A description of Releases or potential

Releases of Hazardous Wastes and/or Hazardous Constituents, including identification of the Hazardous Waste(s) or Hazardous Constituent(s) released or potentially released, locations and results of any sampling;

- iii. A determination that either a Release has occurred, that there is a potential for a Release to occur, or that there is no potential for a Release to occur. If Engelhard determines that there is no potential for a Release to occur from an AOC, Engelhard shall explain the basis for such determination;
- iv. Identification of the media of concern for each such AOC;
- v. The location of the AOC at the Facility designated on a Site map; and
- vi. A recommendation as to whether the AOC requires further investigation. The recommendation for further investigation of an AOC shall be based upon the existence of a Release or potential Release of Hazardous Wastes and/or Hazardous Constituents.

- b. Based upon the information and recommendation

submitted by Engelhard, EPA will determine whether further investigation of an AOC will be conducted. If EPA determines that further investigation of an AOC is necessary, Engelhard shall add the AOC to Attachment I and submit a proposal for investigation of such AOC.

C. Preliminary Investigation of Potential Corrective Measures

1. The RFI Proposal shall identify the potential corrective measure technologies that may be used on-site or off-site to contain, treat, remediate and/or dispose of the contamination resulting from the Release of Hazardous Waste and/or Hazardous Constituents from the AOCs and sub-AOCs listed in Attachment I. This preliminary investigation shall summarize all prior investigations, Stabilization measures/interim measures planned or implemented, and identify field data that needs to be collected during implementation of the RFI to facilitate the technical evaluation and selection of the potential corrective measure or measures.

The preliminary investigation of potential corrective measures shall include an overview of Stabilization measures which are planned or implemented, and shall discuss the potential need

for additional treatment technologies and how they could be integrated to provide a long term remedy. The preliminary investigation of potential corrective measures shall also include a discussion of available technologies that could be used to remediate the contamination resulting from the Release of Hazardous Waste and/or Hazardous Constituents from the AOCs and sub-AOCs at the Facility. The discussion shall include a general analysis of the effectiveness of each technology considered. The preliminary investigation of potential corrective measures shall include the following:

- a. Potential on-site treatment technologies available and a description of how those potential solutions would be incorporated into known or anticipated Site conditions, including planned or implemented Stabilization measures. The alternative treatment section shall include a discussion of the information available or necessary to evaluate the following:
  - i. Compatibility of waste and construction or treatment materials;
  - ii. Effectiveness of treatment;
  - iii. Treatability of wastes; and

iv. Longevity and maintenance considerations of the alternatives.

- b. Potential recycling of wastes to recover or separate constituents and minimize the quantity of the waste materials.
- c. Potential off-site treatment or disposal alternatives.
- d. A summary of the measures that will be undertaken in order to obtain the information necessary to evaluate potential corrective measures.

D. Facility Investigation

The RFI Proposal shall include the following:

1. Environmental Setting

The RFI Proposal shall include a proposed study to further characterize, as necessary, the environmental setting of the Facility with respect to soils, Ground Water, surface waters, and sediments. In the proposed study, Engelhard shall document the methodology to be used in obtaining the data necessary to provide the information required in the RFI Report, as detailed in Section IX below. The environmental setting section shall include the following:

a. Soil/Bedrock Characterization

Engelhard shall include a description of the

procedures it intends to use to gather additional data, as necessary, sufficient to characterize the subsurface geology around each enumerated AOC and sub-AOC. This description shall include the details of the procedures for characterizing subsurface conditions outlined in Section A.1. of Appendix I and the applicable sections of Appendix II.

b. Procedures for Determining Ground-Water Hydraulics

Engelhard shall include a description of the procedures it intends to use to gather additional data, as necessary, sufficient to characterize the ground-water hydraulics associated with the Site. The description shall identify the procedures for establishing the rate and direction of ground-water flow in the horizontal and vertical directions and determining the areas of ground-water discharge to surface water and ground-water recharge by surface water. The description shall also identify the procedures for determining variations of ground-water flow rate and direction (i.e., seasonal), and the hydraulic properties of



each stratum identified in the boring program. The description shall include the information required and outlined in Section A.2. of Appendix I and the applicable sections of Appendix II.

c. Procedures for Evaluating Surface Waters and Sediments

Engelhard shall include a description of the procedures it intends to use to gather additional data, as necessary, sufficient to evaluate the physical and chemical nature of surface waters and sediments at and in the vicinity of the Facility including Turnpike Lake and the unnamed streams and wetlands located east of the Facility. The description shall identify the procedures to be used in generating the information required in Section A.3. of Appendix I and the applicable sections of Appendix II.

d. Procedures for Evaluating Climatic Conditions

Engelhard shall include a description of the procedures it intends to use in evaluating climatic conditions that may cause or influence air flow in the vicinity of the Facility. This description shall demonstrate

how Engelhard will generate the information required in Section A.4. of Appendix I and the applicable sections of Appendix II.

2. Source and Waste Characterization

The RFI Proposal shall include a proposed study to characterize the AOCs and sub-AOCs identified in Attachment I, and any additional AOCs identified pursuant to Section V.B. above, and the wastes placed in these AOCs and sub-AOCs. The proposed study shall document the methodology for obtaining additional data, as necessary, and drawing conclusions in order to provide the information required in the RFI Report, as detailed in Section IX below, and Appendices I and II, as applicable. The proposed study shall include a description of the procedures Engelhard intends to use to determine the quantity, physical characteristics, migration/dispersal characteristics, toxicity, and chemical composition of the Hazardous Waste and/or Hazardous Constituents in each AOC and sub-AOC.

3. Contamination Characterization

The RFI Proposal shall include proposed further contamination characterization programs, as necessary, designed to measure the concentration, rate, as applicable, and extent of Hazardous Waste and/or Hazardous Constituents released from the

AOCs and sub-AOCs listed in Attachment I and those AOCs added to Attachment I, if any, into the Ground Water, soils, surface water and sediments. The proposed contamination characterization programs shall document the methodology to be used in obtaining the additional data, as necessary, to provide the information required in the RFI Report, as detailed in Section IX below. The contamination characterization proposal shall include the following:

- a. Ground Water: A description of the Monitoring Well network and sampling methodologies Engelhard proposes to use to gather data sufficient to characterize the vertical and horizontal nature of all Releases of Hazardous Wastes and/or Hazardous Constituents, from the AOCs and sub-AOCs listed in Attachment I and those AOCs added to Attachment I, if any, for Ground Water, the concentrations of such Hazardous Wastes and/or Hazardous Constituents, and the rate and extent of their migration. This description shall include the information required in the applicable sections of Appendices I and II, and the following:
  - i. Procedures to verify whether or not

contamination has occurred; and

- ii. Provisions demonstrating that any determination utilizing Background ground-water quality is consistent with Section XI.A.2.

- b. Soil: A description of the procedures and sampling methodologies Engelhard proposes to use to gather data sufficient to characterize the vertical and horizontal nature of Releases of Hazardous Waste and/or Hazardous Constituents from the AOCs and sub-AOCs listed in Attachment I and those AOCs added to Attachment I, if any, for soil, the concentrations of such Hazardous Wastes and the rate, as appropriate, and extent of their migration. This description shall include the information required in the applicable sections of Appendices I and II and the following:

- i. Procedures to verify whether or not contamination has occurred; and
- ii. Provisions demonstrating that any determination utilizing Background soil quality is consistent with Section XI.B.2.

- c. Surface Water and Sediments: A description

of the procedures and sampling methodologies Engelhard proposes to use to gather data sufficient to characterize the nature and extent of all Releases of Hazardous Waste and/or Hazardous Constituents from the AOCs and sub-AOCs listed in Attachment I and those AOCs added to Attachment I, if any, for surface waters and sediments, the concentrations of such Hazardous Wastes and the rate, as appropriate, and extent of their migration. This description shall include the information required in the applicable sections of Appendices I and II, and the following:

- i. Procedures to verify whether or not contamination has occurred; and
- ii. Provisions demonstrating that any determination utilizing upgradient surface water and sediment quality is consistent with Section XI.C.2.

4. Health and Environmental Risk Assessment

The RFI Proposal shall include a Health and Environmental Risk Assessment ("HERA") proposal designed to identify the human populations and environmental systems that may be exposed to Hazardous Waste and/or Hazardous Constituents

released from the AOCs and sub-AOCs listed in Attachment I and added to Attachment I, if any, and quantify, where appropriate, the risks to human health and the environment. The HERA proposal shall document the methodology for obtaining data and drawing conclusions to provide the types of information contemplated in Appendix III.

5. Data Collection Quality Assurance Plan

The RFI Proposal shall include a proposed plan to document all monitoring procedures (e.g., sampling, field measurements and sample analysis) performed during the investigation to characterize the environmental setting, the contaminant sources and the contaminant migration. The proposed plan shall also provide that all information, validated data and resulting decisions will be technically sound, and properly documented. The Data Collection Quality Assurance Plan shall include the information required in Appendix I and Appendix II, and shall include the following:

a. Data Collection Strategy

- i. A description of the data quality objectives considering the intended uses of the data;
- ii. A description of methods and procedures

proposed to assess the precision,  
accuracy and completeness of the  
measurement data; and

iii. A description of the proposed measures  
to assure that the following data  
collected by Engelhard and/or its  
contractors are comparable:

- aa) RFI data generated by Engelhard  
over some time period;
- bb) RFI data generated by an outside  
laboratory or consultant versus  
data generated by Engelhard;
- cc) Data generated by separate  
consultants or laboratories; and
- dd) Data generated by an outside  
consultant or laboratory over some  
time period.

b. Sampling

Sampling plans must be capable of yielding  
representative samples. The proposed  
programs shall document the methodology to be  
used in obtaining and validating the data  
necessary to provide the information  
required. The sampling plan shall include  
the following elements:

- 1. Proposed conditions under which sampling

shall be conducted, ensuring representative sampling and sampling of worst-case conditions when concentrations are likely to be greatest;

- ii. Proposed number and locations of samples for each media;
- iii. Measures used to prevent and monitor for possible sample contamination; and
- iv. Procedures to be used in validating environmental data collected under the RFI.

6. Data Management Plan

The RFI Proposal shall include a proposed Data Management Plan to document and track investigation data and results. This plan shall identify and establish data documentation materials and procedures, project file requirements and project-related progress reporting procedures and documents. The plan shall also propose a format to be used to present the validated data and conclusions of the RFI. The Data Management Plan shall provide that the following be documented, as indicated below:

a. Data Record

The following shall be presented in a



validated data record:

- i. Unique sample or field measurement identification codes;
- ii. Sampling or field measurement locations and sample or measurement types;
- iii. Sampling or field measurement validated data;
- iv. Laboratory analysis ID numbers;
- v. Properties or components measured; and
- vi. Validated results of analyses (e.g., concentration and detection limits).

b. Tabular Displays

The following data shall be presented in appropriate tabular displays:

- i. Results for each constituent in each medium;
- ii. Data reductions for statistical analyses;
- iii. Sorting of data by potential stratification factors (e.g., location, soil layer);
- iv. Summary data; and
- v. The validated data record as applicable.

c. Graphical Displays

The following data shall be presented in appropriate graphical formats (e.g., bar

graphs, line graphs, area or plan maps, isopleth plots, cross-sectional plots or transects, three dimensional graphs, fence diagrams, etc.):

- i. Sampling locations and sampling grids;
- ii. Boundaries of sampling areas and areas where more data are required;
- iii. Range of concentration for each constituent at each sampling location;
- iv. Geographical extent of contamination;
- v. Constituent concentrations, averages and maxima at each sampling location;
- vi. Changes in concentration in relation to distance from the source, time, depth or other parameters; and
- vii. Features affecting intramedia transport and which show potential receptors.

7. Health and Safety Plan

- a. The RFI Proposal shall include a Health and Safety Plan. EPA may comment on, but will not approve the Health and Safety Plan. The Health and Safety Plan shall include the following:
  - i. A Facility description including availability of resources such as roads, water supply, electricity and telephone.

Guidance Manual for Hazardous Waste Site Activities (1985);

- ii. EPA Order 1440.1 - Respirator Protection;
- iii. EPA Order 1440.3 - Health and Safety Requirements for Employees engaged in Field Activities;
- iv. EPA Standard Operating Safety Guide (1984);
- v. OSHA regulations, particularly in 29 C.F.R. §§ 1910 and 1926;
- vi. NRC regulations, particularly in 10 C.F.R. Part 20;
- vii. State and local regulations; and
- viii. Any other relevant final or interim final EPA guidance.

E. Project Management Plan

The RFI Proposal shall include a Project Management Plan to conduct an RFI in two (2) phases, establishing a proposed schedule within which specified elements of the work required under this Consent Order are to be completed. The proposed schedule shall specify that implementation of the RFI Proposal shall begin as soon as practicable after EPA approval. The Project Management Plan shall also require the submittal of bimonthly reports, provide for bimonthly conference

calls and the submittal of an interim report at the completion of the first phase of the study. Engelhard shall submit a justification for the proposed schedule and shall have the burden of establishing that the proposed schedule is reasonable.

The Project Management Plan shall specify the following to implement the RFI Proposal:

1. Phase I tasks shall include the following types of field work: the surveying and gridding of all relevant areas; geophysical surveys, as appropriate; at least two sampling events for Ground Water and surface water; for each AOC and sub-AOCs listed in Attachment I, at least one sampling event for soils, sediments and fish; test borings/pits sufficient to define subsurface geologic and hydrogeologic units; identification of any additional AOCs and media of concern satisfying Section V.B. above; and preliminary investigation of corrective measures satisfying Section V.C. above. The Project Management Plan shall propose a schedule for each of these tasks and shall provide that all Phase I tasks shall be completed by a specified date, not to exceed eight (8) months after EPA's written approval of the RFI Proposal.

The Phase I tasks shall be considered to be complete at the completion of the final field task included therein.

2. Following the approval of the RFI Proposal and throughout all the phases of the RFI, Engelhard shall provide EPA with bimonthly written progress reports each second month, by the fifteenth (15) day of the following month. These progress reports shall include:

- a. A description of all tasks completed during the previous two (2) months (e.g., sampling activities and dates thereof, number of samples taken, and dates that samples are sent in for analysis);
- b. A description of all required tasks not completed during the previous two (2) months and an explanation as to why the tasks were not completed;
- c. All validated results of sampling, tests and other data generated or received by Engelhard during the previous two (2) months;
- d. A description of any problem areas and anticipated problem areas that may arise in complying with this Consent Order, and how Engelhard proposes to overcome these problems; and

- e. A projection of tasks (sampling, etc.) for the next two months with proposed schedules.
- 3. If, due to scheduling problems, sickness, or for any other reason, a bimonthly conference call does not occur during a month in which a written progress report is not scheduled to be submitted, Engelhard agrees to submit a written progress report for that month, which includes the information set forth above, by the fifteenth (15th) day of the following month.
- 4. At the completion of the Phase I tasks, Engelhard shall submit to EPA within ninety (90) days the Phase I Interim Report and Phase II Proposal, as required in Section VII below. The Phase II Proposal shall provide for submission of a schedule for completion of Phase II of the Facility Investigation.
- 5. Phase II tasks shall include the following field work: geophysical surveys, as necessary; the installation of all new additional Monitoring Wells, as necessary; for each AOC and sub-AOC listed in Attachment I, at least two (2) sampling events for Ground Water and surface water; sampling for soils and sediments, as necessary; other sampling as proposed in the Phase I Interim Report and Phase II Proposal; pilot testing of

soil gas extraction technologies in selected AOCs; and a final survey of the Facility incorporating all changes conducted pursuant to this Consent Order (i.e., showing all new Monitoring Wells, sampling locations, geophysical survey lines, etc.). Phase II tasks shall also include, without limitation, the analysis necessary for the proposal of Media Protection Standards for all Hazardous Waste and/or Hazardous Constituents released from the AOCs and sub-AOCs listed in Attachment I, as required in Section XI below. Phase II tasks shall be completed in accordance with the schedule established pursuant to Sections VII through IX below.

6. Following the completion of the final Phase II field task, Engelhard shall submit to EPA within one hundred twenty (120) Days, the RFI Report, as set forth in Section IX below. By the same date, Engelhard shall also submit to EPA its proposed Media Protection Standards, as set forth in Section XI below.

#### **VI. REVIEW OF THE RFI PROPOSAL**

After Engelhard submits the RFI Proposal in accordance with Section V above, the Director will review the RFI Proposal in accordance with the procedure set forth in Section XXVII below. EPA may review and comment on, but will not approve,

the Health and Safety Plan.

**VII. PHASE I INTERIM REPORT AND PHASE II PROPOSAL**

Within ninety (90) days of the completion of the Phase I tasks, Engelhard shall submit to EPA a Phase I Interim Report and Phase II Proposal. This document shall include the following:

1. A summary of the results of Phase I;
2. A proposal for any additional work, besides that set out in Section V.E.5. above, which should be included in Phase II;
3. A proposed schedule for each of the Phase II tasks, including those established pursuant to Sections V.E.5. and VII.2. above. In no event shall this schedule allow more than ten (10) months for the completion of the Phase II tasks. The Phase II tasks shall be considered to be complete at the completion of the final field task included therein;
4. A statement as to whether any additional media of concern have been identified for the AOCs and/or sub-AOCs listed in Attachment I since the submittal of the RFI Proposal. If so, the Phase I Interim Report and Phase II Proposal shall also include a proposed modification to Attachment I, as appropriate, indicating that additional media of concern have been identified and that they



shall be investigated for the specified AOCs and/or sub-AOCs. Additionally, the Phase I Interim Report and Phase II Proposal shall contain a proposed schedule showing how investigation of the newly identified media of concern shall be integrated into the ongoing investigation. Engelhard shall have the burden of justifying that the proposed schedule is as expeditious as possible. If Engelhard concludes that the newly identified media of concern cannot be investigated within the timeframe established for Phase II pursuant to Sections V.E.4. and VII.3. above, Engelhard shall submit a recommendation as to whether the newly proposed investigations are so central to the RFI that more time should be allotted for Phase II or, alternatively, as to whether such investigations should proceed on a separate track without delaying implementation of the subsequent steps in the corrective action process;

5. A statement as to whether any additional AOCs have been identified since the submittal of the RFI Proposal.
  - a. If Engelhard identifies any additional AOCs at the Facility, Engelhard shall submit to EPA the following information for each such

AOC:

- i. Characteristics, including size, volume, and other physical characteristics;
- ii. A description of Releases or potential Releases of Hazardous Wastes and/or Hazardous Constituents, including identification of the Hazardous Waste(s) and/or Hazardous Constituent(s) released or potentially released, locations and results of any sampling;
- iii. A determination that either a Release has occurred, that there is a potential for a Release to occur, or that there is no potential for a Release to occur. If Engelhard determines that there is no potential for a Release to occur from an AOC, Engelhard shall explain the basis for such determination;
- iv. Identification of the media of concern for each such AOC;
- v. The location of the AOC at the Facility designated on a Site map; and
- vi. A recommendation as to whether the AOC requires further investigation. The recommendation for further investigation of an AOC shall be based upon the

existence of a Release or potential  
Release of Hazardous Wastes and/or  
Hazardous Constituents.

- b. Based upon the information and recommendation submitted by Engelhard, EPA shall determine whether further investigation of an AOC shall be conducted. If EPA determines that further investigation of an AOC is necessary, Engelhard shall add the AOC to Attachment I and submit a proposal for investigation of the AOC. The Phase I Interim Report and Phase II Proposal shall also include a proposed modification to Attachment I, as appropriate, indicating that one or more AOCs have been identified and that they shall be investigated for the specified media of concern. Additionally, the Phase I Interim Report and Phase II Proposal shall contain a proposed schedule showing how investigation of the newly identified AOCs shall be integrated into the ongoing investigation. Engelhard shall have the burden of justifying that the proposed schedule is as expeditious as possible. If Engelhard concludes that the newly identified AOCs cannot be investigated within the timeframe established for Phase II

pursuant to Sections V.E.4. and VII.3. above, Engelhard shall submit a recommendation as to whether the newly proposed investigations are so central to the RFI that more time should be allotted for Phase II or, alternatively, as to whether such investigations should proceed on a separate track without delaying implementation of the subsequent steps in the corrective action process.

6. A statement as to whether any of the Releases identified in Attachment I, or any of the media or AOCs identified pursuant to Sections VII.4. or 5. above, merit immediate attention through the implementation of interim measures. If any interim measures are deemed to be necessary, Engelhard shall propose specific interim measures, together with appropriate protocols and schedules. If the proposed timeframe for the interim measures exceeds the timeframe for Phase II established pursuant to Sections V.E.4. and VII.3. above, Engelhard shall propose the submission of an Interim Measures Report within sixty (60) days after the completion of the final field task of the interim measure(s) in question. In such event, the proposal shall also allow for review and possible modification by the Director, as

provided under analogous sections of this Consent Order (see, e.g., Section VI below).

**VIII. REVIEW OF THE PHASE I INTERIM REPORT AND PHASE II PROPOSAL**

After Engelhard submits the Phase I Interim Report and Phase II Proposal, the Director will review the Phase I Interim Report and Phase II Proposal in accordance with the procedure set forth in Section XXVII.

**IX. RFI REPORT**

Within one hundred twenty (120) days after the completion of the final Phase II field task, Engelhard shall submit to EPA an RFI Report in accordance with the approved RFI proposals and which shall contain the following information:

**A. Environmental Setting**

**1. Hydrogeology**

The RFI Report shall evaluate the hydrogeologic conditions at the Facility. The RFI Report shall include:

**a. A description of the regional and Facility-specific geologic and hydrogeologic characteristics affecting ground-water flow beneath the Facility, including:**

**i. Regional and Facility-specific stratigraphy (soil and unconsolidated sediment cover, bedrock, strike and dip, and formation origins), illustrated by geologic maps and cross sections with**

supporting geophysical data as required in the RFI Proposal, and boring logs as available;

ii. Regional and local structural features (e.g., folding, faulting, tilting, jointing, etc.), including all supporting data or references, as available;

iii. Depositional history of unconsolidated and consolidated units;

iv. Regional and Facility-specific hydrogeologic flow patterns, including an analysis of the interrelationship between the bedrock and surficial Aquifers;

v. An analysis of the potential influence(s) of geologic, topographic, and geomorphic features on the ground-water flow system; and

vi. Identification and characterization of areas and amounts of ground-water recharge and discharge.

b. A classification and description of the hydrogeologic properties of the Facility-specific geologic units in Section IX.A.1.a.i. above, including:

- i. Hydraulic conductivity and porosity collected at ten (10) foot intervals or as changes in stratigraphy occur, as appropriate;
  - ii. Lithology, grain size distribution, texture, and uniformity; and
  - iii. An interpretation of hydraulic interconnections between bedrock and overlying unconsolidated saturated zones.
- c. A description of ground-water quality and flow beneath the Facility, based upon a review of existing data as is available upon diligent inquiry and the results of soil borings, geophysical investigations, and ground-water monitoring. This description shall include the following:
- i. Water levels during high and low flow season;
  - ii. Vertical and horizontal flow directions during high and low flow seasons noting any changes in the hydraulic gradients; and
  - iii. Water level contour maps, vertical gradient sections, and well hydrographs shall be submitted as documentation of

the above.

- d. A description of man-made influences that reasonably may affect the hydrogeology of the Site, identifying:
  - i. Local water supply and production wells with reported and/or approximate schedules of pumping, as available;
  - ii. Hydraulic structures (pipelines, french drains, ditches); and
  - iii. Ground-water mounding.

2. Soils

The RFI Report shall include an evaluation of surface and subsurface soils in the vicinity of the AOCs and sub-AOCs listed in Attachment I. Those features and properties of the soils that reasonably may cause or influence the migration, transformation, or attenuation of Hazardous Wastes and/or Hazardous Constituents shall be characterized. The RFI Report also shall include maps and cross-sectional profiles of the soils. The Report shall include the following for each stratigraphic unit identified:

- a. Soil Conservation Service soil classification as appropriate;
- b. Surface soil distribution;
- c. Soil profile;



- d. Hydraulic conductivity;
- e. Bulk density;
- f. Particle size distribution;
- g. Depth of water table;
- h. Soil pH;
- j. Storage capacity; and
- k. Vertical flow rate/infiltration rate.

3. Surface Water and Sediments

The RFI Report shall include an evaluation of the surface waters, sediments, and regional surface water hydraulics in the vicinity of the Facility.

Engelhard shall provide the following information:

- a. A description of the temporal and permanent surface-water bodies including:
  - i. For ponds, lakes or impoundments:  
location, elevation, and an estimate of surface area depth, volume, and freeboard;
  - ii. For streams, ditches and channels:  
location, elevation, an estimate of flow rates, depth, width, seasonal fluctuation, and flood potential (i.e., 100 year storm event), and state stream classification (for streams only); and
  - iii. Drainage patterns.
- b. A description of the chemistries of the

surface water and sediments. This includes determining the pH, total dissolved solids, total suspended solids, biochemical oxygen demand, alkalinity, conductivity, dissolved oxygen profiles, nutrients  $\text{NH}_3$ ,  $\text{NO}_3^-$ ,  $\text{NO}_2^-$ ,  $\text{PO}_4^{3-}$ , chemical oxygen demand, total organic carbon, and specific contaminant concentrations as applicable and available.

- c. A description of sediment characteristics, including:
  - i. Deposition area(s);
  - ii. Thickness profile(s);
  - iii. Physical and chemical parameters (e.g., grain size distribution, density, total organic carbon content, ion exchange capacity, pH.); and
  - iv. Potential seasonal variations in sediment transport.

B. Source and Waste Characterization

The RFI Report shall contain analytical data to characterize the wastes, to the extent practicable, and areas where they have been placed, collected or removed, including a description and map(s) of the AOCs and sub-AOCs listed in Attachment I. Engelhard shall provide the following information, as applicable, for each AOC and sub-AOC:

1. AOC and sub-AOC Characteristics:
  - a. Location of AOC and sub-AOC;
  - b. Type of AOC or sub-AOC (e.g., tank, waste pile, etc.);
  - c. Design features;
  - d. Operating practices (past and present as applicable);
  - e. Period of operation;
  - f. Age of AOC or sub-AOC;
  - g. General physical conditions;
  - h. Method used to close the AOC and sub-AOC;  
and
  - i. Information source(s) for the AOC and sub-AOC characteristics described above.
2. Waste Characteristics:
  - a. Type of waste placed in the AOC and sub-AOC, including:
    - i. Hazardous classification, if determinable (i.e., whether it was, at the time of placement, a non-hazardous or a listed or characteristic Hazardous Waste and, if it was a characteristic Hazardous Waste, what the characteristic was that rendered it hazardous);
    - ii. Quantity;
    - iii. Chemical composition; and

- iv. Toxicity.
- b. Physical and chemical characteristics of such identified non-hazardous wastes and Hazardous Wastes, as applicable and determinable, including:
  - i. Physical form (solid, liquid, gas);
  - ii. Physical description (e.g., powder, oily sludge);
  - iii. pH;
  - iv. General chemical class (e.g., acid, base, solvent);
  - v. Molecular weight;
  - vi. Density;
  - vii. Boiling point;
  - viii. Viscosity;
  - ix. Solubility in water;
  - x. Cohesiveness of the waste; and
  - xi. Vapor pressure.
- c. Migration and dispersal characteristics of such Hazardous Wastes and/or Hazardous Constituents, as applicable, including:
  - i. Sorption;
  - ii. Biodegradability, bioaccumulation, biotransformation;
  - iii. Photodegradation rates;
  - iv. Hydrolysis rates;

- iv. Toxicity.
- b. Physical and chemical characteristics of such identified non-hazardous wastes and Hazardous Wastes, as applicable and determinable, including:
  - i. Physical form (solid, liquid, gas);
  - ii. Physical description (e.g., powder, oily sludge);
  - iii. pH;
  - iv. General chemical class (e.g., acid, base, solvent);
  - v. Molecular weight;
  - vi. Density;
  - vii. Boiling point;
  - viii. Viscosity;
  - ix. Solubility in water;
  - x. Cohesiveness of the waste; and
  - xi. Vapor pressure.
- c. Migration and dispersal characteristics of such Hazardous Wastes and/or Hazardous Constituents, as applicable, including:
  - i. Sorption;
  - ii. Biodegradability, bioaccumulation, biotransformation;
  - iii. Photodegradation rates;
  - iv. Hydrolysis rates;

v. Volatilization rates; and

vi. Chemical transformations.

C. Contamination Characterization

The RFI Report shall include documentation of the rate of contaminant movement, concentration, and extent of contamination from Releases of Hazardous Waste and/or Hazardous Constituents from the AOCs and sub-AOCs listed in Attachment I into the Ground Water, soils, surface water, and sediments, as applicable. The RFI Report shall include a characterization of the media contaminated at each AOC and sub-AOC as specified in Attachment I. Engelhard shall provide the following information:

1. Ground-Water Contamination

In the RFI Report, Engelhard shall characterize all ground-water contamination resulting from any Releases of Hazardous Wastes and/or Hazardous Constituents from the AOCs and sub-AOCs, as listed in Attachment I for Ground Water as follows:

- a. A description of the horizontal and vertical extent of any such immiscible or dissolved Hazardous Wastes and/or Hazardous Constituents in the Ground Water originating from the Facility;
- b. The horizontal and vertical extent and direction of movement of such Hazardous

Wastes and/or Hazardous Constituents;

- c. The rate of movement of such Hazardous Wastes and/or Hazardous Constituents;
- d. The horizontal and vertical concentration profiles of Appendix IX constituents in the Ground Water from selected wells;
- e. An evaluation of factors influencing the movement of Hazardous Wastes and/or Hazardous Constituents released from AOCs and sub-AOCs, including the combined effect of all Hazardous Constituents detected; and
- f. An extrapolation of future movement of Hazardous Wastes and/or Hazardous Constituents, including a discussion of degradation, attenuation, and diffusion.

2. Soil Contamination

In the RFI Report, Engelhard shall characterize the contamination of the surface and subsurface soils in the vicinity of Releases of any Hazardous Waste and/or Hazardous Constituents from the AOCs and sub-AOCs identified in Attachment I for soil. Engelhard shall provide the following information:

- a. A description of the vertical and horizontal extent of contamination including estimated volumes of contaminated soil associated with a range of concentrations;

- b. A description of contaminant and soil chemical properties within the saturated and unsaturated contaminated area(s). The described properties shall include contaminant solubility, speciation, adsorption, leachability, exchange capacity, biodegradability, hydrolysis, photolysis, oxidation, and any other factors that might affect contaminant migration and transformation in soil;
  - c. Specific concentrations of Hazardous Wastes and/or Hazardous Constituents in soil;
  - d. The rate and direction of movement of Hazardous Wastes and/or Hazardous Constituents in soil; and
  - e. An extrapolation of future movement of Hazardous Wastes and/or Hazardous Constituents in soil.
3. Surface Water and Sediment Contamination
- In the RFI Report, Engelhard shall characterize the contamination in surface water bodies and sediments resulting from any Releases of Hazardous Waste and/or Hazardous Constituents from the AOCs and sub-AOCs listed in Attachment I for surface water and sediments. Engelhard shall provide the following information:



- a. A description of the horizontal extent, and where appropriate, the vertical extent of any immiscible and/or dissolved Hazardous Waste and/or Hazardous Constituents in surface water and sediments released from the Facility, and the extent of contamination in underlying sediments;
- b. A description of the direction and extent of movement of Hazardous Wastes and/or Hazardous Constituents;
- c. The rate of movement of Hazardous Wastes and/or Hazardous Constituents;
- d. An evaluation of the physical, biological and chemical factors influencing movement of Hazardous Wastes and/or Hazardous Constituents;
- e. An extrapolation of future movement of Hazardous Wastes and/or Hazardous Constituents; and
- f. A description of the chemistries of the natural surface water and sediments in the vicinity of the Facility. This includes determining the pH, total dissolved solids, total suspended solids, biochemical oxygen demand, alkalinity, conductivity, dissolved oxygen profiles, nutrients  $\text{NH}_3$ ,  $\text{NO}_3^-/\text{NO}_2^-$ ,  $\text{PO}_4^{3-}$ ,

chemical oxygen demand, total organic carbon, and specific concentrations of Hazardous Wastes and/or Hazardous Constituents, as applicable.

D. Health and Environmental Risk Assessment

The RFI Report shall include the completed Health and Environmental Risk Assessment, as detailed in the approved RFI Proposal.

E. Stabilization And Interim Measures Report

The RFI Report shall include a summary of Stabilization measures and any interim measures implemented, including an evaluation of post remedial action sampling/monitoring and an evaluation of the effectiveness of the interim measures and/or Stabilization measures, whether the Stabilization measures have achieved the applicable performance standards specified in and approved pursuant to Section I.A. above, and whether these measures have been implemented according to the approved schedules.

F. Identification of Additional Tasks

1. The RFI Report shall include a statement as to whether any additional media of concern have been identified for the AOCs and/or sub-AOCs listed in Attachment I since the submittal of the Phase I Interim Report and Phase II Proposal and, if so, a proposed modification to the Attachment,

indicating that these media shall be investigated for the appropriate AOCs and/or sub-AOCs. If additional media of concern have been identified, the RFI Report shall include a proposed scope of investigation, together with appropriate protocol and schedules. Additionally, if further investigation is to be conducted, Engelhard shall propose the submission of a supplemental RFI Report within sixty (60) days after the completion of the final field task of the investigation. This supplemental report shall follow the general outline of Section IX of this Consent Order. In such event, the proposal and supplemental report shall be reviewed in accordance with the procedure set forth in Section XXVII below.

2. The RFI Report shall include a statement as to whether any additional AOCs have been identified since the submittal of the Phase I Interim Report.
  - a. If Engelhard identifies any additional AOCs at the Facility, Engelhard shall submit to EPA the following information for each such AOC:
    - i. Characteristics, including size, volume, and other physical characteristics;
    - ii. A description of Releases or potential Releases of Hazardous Wastes and/or

Hazardous Constituents, including identification of the Hazardous Waste(s) or Hazardous Constituent(s) released or potentially released, locations and results of any sampling;

- iii. A determination that either a Release has occurred, that there is a potential for a Release to occur, or that there is no potential for a Release to occur. If Engelhard determines that there is no potential for a Release to occur from an AOC, Engelhard shall explain the basis for such determination;
- iv. Identification of the media of concern for each such AOC;
- v. The location of the AOC at the Facility designated on a Site map; and
- vi. A recommendation as to whether the AOC requires further investigation. The recommendation for further investigation of an AOC shall be based upon the existence of a Release or potential Release of Hazardous Wastes and/or Hazardous Constituents.

- b. Based upon the information and recommendation submitted by Engelhard, EPA will determine

interim measures are deemed to be necessary, Engelhard shall propose specific interim measures, together with appropriate protocol and schedules. In such event, Engelhard shall also propose the submission of an Interim Measures Report within sixty (60) days after the completion of the final field task of the interim measure(s) in question.

**X. REVIEW OF THE RFI REPORT**

After Engelhard submits the RFI Report, the Director will review the RFI Report in accordance with the procedure set forth in Section XXVII below.

**XI. MEDIA PROTECTION STANDARDS ("MPS") PROPOSAL**

Media Protection Standards will be used as guidelines for measuring the necessity for and/or the degree of protection afforded by any future corrective measures. On the same date that Engelhard submits the RFI Report pursuant to Section IX of this Consent Order, Engelhard shall submit to EPA a proposed MPS for each Hazardous Waste and/or Hazardous Constituent released from any of the AOCs and/or sub-AOCs listed in Attachment I.

Engelhard shall propose MPSs for Releases into the following media as applicable: Ground Water, soils, surface water, and sediments. For each proposed MPS, Engelhard shall include data justifying and supporting the limits specified and locations at which the limits shall be met. The

proposed MPSe shall comply with the following media specific parameters:

A. Ground-Water Protection Standards

1. Engelhard shall propose protection standards for each Hazardous Constituent released into the Ground Water from the applicable AOCs and/or sub-AOCs listed in Attachment I. Engelhard shall use one or more of the following methods to set these standards:
  - a. The proposed ground-water protection standard for any such Hazardous Constituents shall not exceed the Background level for such Hazardous Constituents in the Ground Water at the time Engelhard submits its proposal; or
  - b. For any such Hazardous Constituent, the proposed ground-water protection standard may not exceed those limits specified in 40 C.F.R. §§ 141.60 to 141.63; or
  - c. Engelhard may propose an Alternate Concentration Limit (ACL) for any such Hazardous Constituent. If Engelhard chooses to propose a ground-water ACL, Engelhard shall have the burden of establishing that the proposed ACL will not pose a substantial present or potential hazard to human health or the environment as long as the ACL is not

exceeded; or

- d. The proposed ground-water protection standard may be a combination of any of the methods described above.

- 2. If Engelhard chooses to propose Background ground-water quality as the ground-water protection standards pursuant to Section XI.A.1.a. above, Engelhard shall determine Background as follows:

- a. The ground-water monitoring system must consist of a sufficient number of wells installed at appropriate locations and depths to yield ground-water samples that represent the quality of Background Ground Water.
- b. Each ground-water Monitoring Well must be cased in a manner that maintains the integrity of the Monitoring Well bore hole. The casing must be screened and packed with gravel or sand, where necessary, to enable Engelhard to collect representative ground-water samples and minimize well siltation. The space between the bore hole and the well casing which projects above the sampling depth must be sealed to prevent contamination of samples and the Ground Water. The well stick-up must be protected from damage by traffic or other potential harm.

- c. At least two (2) sampling rounds shall be conducted in accordance with the sampling and analysis plan contained in the approved RFI Proposal.
- 3. If Engelhard chooses to propose ground-water ACLs pursuant to Section XI.A.1.c. above, it shall submit support for the proposed ACLs in accordance with "Alternate Concentration Limit Guidance," Part I, OSW, U.S. EPA, July 1987, and any other relevant final or interim final EPA guidance. For any proposed ACLs, Engelhard shall include a justification including a detailed analysis of the following issues:
  - a. Reasonably potential adverse effects on ground-water quality, considering:
    - i. The physical and chemical characteristics of the Hazardous Waste or Hazardous Constituents released from any AOCs and/or sub-AOCs, including their potential for migration;
    - ii. The hydrogeologic characteristics of the Facility and surrounding land;
    - iii. The quantity of Ground Water and the direction of ground-water flow;
    - iv. The location and withdrawal rates of ground-water users;



- v. The current and future uses of Ground Water in the area including state classification;
  - vi. The existing quality of Ground Water, including other sources of contamination and their cumulative impact on ground-water quality;
  - vii. The potential for health risks caused by human exposure to Hazardous Waste and/or Hazardous Constituents detected in Ground Water from the Facility;
  - viii. The potential damage to wildlife, crops, vegetation and physical structures caused by exposure to Hazardous Waste and/or Hazardous Constituents detected in Ground Water from the Facility; and
  - ix. The persistence and permanence of the likely potential adverse effects.
- b. Reasonably potential adverse effects on hydraulically connected surface water quality, considering:
- i. The volume and physical and chemical characteristics of the Hazardous Waste and/or Hazardous Constituents released from any AOCs and/or sub-AOCs;
  - ii. The hydrogeologic characteristics of the

- Facility and surrounding land;
- iii. The quantity and quality of Ground Water and the direction of ground-water flow;
  - iv. The patterns of rainfall in the region;
  - v. The proximity of the AOCs and/or sub-AOCs to surface waters;
  - vi. The current and future uses of surface waters in the area and any Water Quality Standards established for those surface waters including state classification;
  - vii. The existing quality of surface water, including effects of other sources of contamination and the cumulative impact on surface water quality;
  - viii. The reasonable potential for health risks caused by human exposure to Hazardous Waste and/or Hazardous Constituents discharged to surface water from Ground Water from the Facility;
  - ix. The reasonable potential for damage to wildlife, crops, vegetation and physical structures caused by exposure to Hazardous Waste and/or Hazardous Constituents; and
  - x. The persistence and permanence of the potential adverse effects.

B. Soil Protection Standards

1. Engelhard shall propose protection standards for each Hazardous Waste and/or Hazardous Constituent released into the soil from each applicable AOC and/or sub-AOC listed in Attachment I. Engelhard shall use one or more of the following methods to set the standards:
  - a. The proposed soil protection standard for any such Hazardous Waste and/or Hazardous Constituent shall not exceed the Background concentrations for such Hazardous Waste and/or Hazardous Constituent at the time Engelhard submits its proposal; or
  - b. Engelhard may propose an ACL for any such Hazardous Waste and/or Hazardous Constituents. If Engelhard chooses to propose a soil ACL, Engelhard shall have the burden of establishing that the proposed ACL will not pose a substantial present or potential hazard to human health or the environment as long as the ACL is not exceeded; or
  - c. The proposed soil protection standards may be a combination of any of the methods described above.
2. If Engelhard chooses to propose Background soil

quality as the soil protection standards pursuant to Section XI.B.1.a. above, Engelhard shall establish and justify a soil sampling program consisting of a sufficient number of soil borings located at the appropriate locations and depths to represent Background soil quality at or near the Facility.

3. If Engelhard chooses to propose a soil ACL pursuant to Section XI.B.1.b. above, its support and justification for the ACL shall include the following:
  - a. Assumptions for soil intake at all points of exposure, together with the basis therefore;
  - b. Calculation of soil contaminant exposures based assumptions noted in Section XI.B.3.a. above. The total exposure to soil (ingestion, direct contact, etc.) shall be used in calculating the soil contaminant levels at the Point(s) of Exposure that will not result in exceedance of Health Based Criteria for systemic toxicants or carcinogens for the most sensitive human population or critical environmental receptors identified for the Site, whichever is more sensitive;
  - c. Back calculation of soil protection levels

based on attaining ground-water MPS and the soils' potential contribution to ground-water contamination; and

- d. In the absence of specific criteria, Engelhard shall apply results from relevant and accepted human epidemiological studies or animal studies.

C. Surface Water and Sediment Protection Standards

1. Engelhard shall propose protection standards for each Hazardous Waste and/or Hazardous Constituent released into the surface waters and/or sediments from each applicable AOC and/or sub-AOC listed in Attachment I. Engelhard shall use one or more of the following methods to set the standards:

- a. The proposed surface water and sediment protection standard for any such Hazardous Waste and/or Hazardous Constituent shall not exceed the Background concentration for that constituent at the time Engelhard submits its proposal; or
- b. Engelhard may propose an ACL for such Hazardous Waste and/or Hazardous Constituent. If Engelhard chooses to propose a surface water and/or sediment ACL, Engelhard shall have the burden of establishing that the proposed ACL will not pose a substantial

- present or potential hazard to human health or the environment as long as the ACL is not exceeded; or
- c. The proposed surface water standards may not exceed the federally approved Water Quality Standards. The sediment protection standards must be protective of human health and the environment; or
  - d. The proposed surface water and sediment protection standards may be a combination of any of the methods described above.
2. If Engelhard chooses to propose Background surface water and sediment quality as the surface water and sediment protection standards pursuant to Section XI.C.1.a. above, Engelhard shall locate surface water transects up-gradient of all potential Release sources to surface waters from the Facility. A sufficient number of surface water and sediment samples shall be collected at appropriate depths to represent the quality of Background surface water and sediments and a justification for these numbers.
3. If Engelhard chooses to propose a surface water and/or sediment ACL pursuant to Section XI.C.1.b. above, its support and justification for the ACL shall include the following:

- a. Intake assumptions for surface water and sediment at all points of exposure, together with the basis therefore;
- b. Validation of the above assumptions by direct measurements, as appropriate. This validation should indicate the levels of Hazardous Wastes and/or Hazardous Constituents at the point of compliance that will result in surface water and/or sediment contaminant levels at all Points of Exposure that do not exceed Health-Based Criteria for systemic toxicants or carcinogens for the most sensitive human population or critical environmental receptors identified for the Site, whichever is more sensitive;
- c. In the absence of specific criteria, Engelhard shall apply results from relevant and accepted human epidemiological studies or animal studies.

**XII. INTERIM MEASURES**

If, at any time after the effective date of this Consent Order, Engelhard becomes aware of existing information or identifies new or additional information concerning a Release of a Hazardous Waste and/or Hazardous Constituent from any AOC or sub-AOC at the Facility which Engelhard determines, in good faith, poses an actual threat or

potential threat to human health or the environment, Engelhard shall report such information within fourteen (14) days to the Director. The following information shall be provided:

1. Type of AOC or sub-AOC;
2. Map identifying location of the AOC or sub-AOC;
3. Dimensions of the AOC or sub-AOC;
4. Descriptions of wastes that were released from the AOC or sub-AOC;
5. Estimated quantity of each waste released and a description of how the quantity was calculated;
6. For spills, the Zone of Contamination of the area containing released wastes;
7. Proposed actions to clean up, mitigate, or stabilize the effects of the Release; and
8. Potential receptors and their distance from the Release.

On the basis of this data, EPA may require Engelhard to submit an Interim Measures Plan which will be implemented upon EPA review and approval, in accordance with the procedures set forth in Section XXVII.

**XIII. DESIGNATION OF PROJECT COORDINATOR AND EPA PROJECT MANAGER**

1. Within seven (7) days of the effective date of this Consent Order, Engelhard shall notify EPA, in writing, of its designated Project Coordinator, who shall be responsible for overseeing the implementation of the



Consent Order. Within the same seven (7) day time period, EPA shall notify Engelhard of its designated Project Manager who shall be EPA's designated representative with regard to the implementation of this Consent Order. Unless otherwise specified, all communications between Engelhard and EPA, and all documents, reports, approvals and other correspondence concerning the activities performed pursuant to the terms and conditions of the Consent Order, shall be directed through the Project Coordinator and the EPA Project Manager.

2. Either party may designate a new Project Coordinator or Manager provided that it notifies the other party, in writing, at least seven (7) days prior to such redesignation, or as soon as practicable.
3. The absence of the EPA Project Manager shall not be cause for stoppage of work by Engelhard.

#### **XIV. SAMPLING**

1. Engelhard shall provide the validated results of all sampling and/or tests and/or other data generated by it, or on its behalf, with respect to the implementation of this Consent Order, to EPA and shall submit these results in progress reports as described in Sections I.C.2. and V.E.2 of this Consent Order. Any validated sampling results generated by EPA or on its behalf, with respect to implementation of this

Consent Order shall be provided to Engelhard in a timely manner.

2. At the request of EPA, Engelhard shall allow split or duplicate samples to be taken by EPA and/or its authorized representatives, of any samples collected by Engelhard pursuant to the implementation of this Consent Order. Engelhard shall notify EPA not less than ten (10) working days in advance of commencing any sample collection activity.

**XV. SITE ACCESS**

1. EPA and/or any EPA authorized representative shall have the authority to enter and reasonably move about the Facility, accompanied by Engelhard's Project Coordinator or his designee, at all reasonable times for the purposes of, inter alia: interviewing Site personnel and contractors; inspecting records, operating logs, and contracts related to this Consent Order; reviewing Engelhard's progress in carrying out the terms of this Consent Order; conducting such tests as EPA and/or its Project Manager deem necessary using a camera, sound recording, or other documentary type equipment; and verifying the reports and validated data submitted by Engelhard to EPA. Engelhard shall permit such persons to inspect and request and obtain copies of all records, files, photographs, documents, and other writings, including all validated sampling and

monitoring data, relevant to this Consent Order.

2. To the extent that the work required under this Consent Order requires access to or use of property presently owned or under the control of persons other than Engelhard, Engelhard shall use its best efforts to obtain whatever access agreements, easements, rights-of-way, or other rights of entry that are necessary to carry out the terms of this Consent Order. Such access agreements shall provide for reasonable access by EPA and/or any authorized EPA representative to the property for the purpose of observing Engelhard's activities undertaken pursuant to this Consent Order.
3. For purposes of Paragraph 2 above, "best efforts" shall include the offering of reasonable compensation for the requisite access agreements, easements, rights-of-way, or other rights of entry, if access cannot otherwise be obtained.
4. In the event that any access agreement required in Paragraph 2 above, cannot be obtained at least thirty (30) days prior to the date that access is necessary, Engelhard shall immediately notify EPA of its inability to obtain such access agreement.
5. Nothing in this Consent Order shall be construed to limit EPA's authority to exercise its rights pursuant to Section 3007 of RCRA, 42 U.S.C. § 6927, or to affect

any right of entry possessed by EPA pursuant to any applicable laws, regulations, or permits.

**XVI. RETENTION AND AVAILABILITY OF INFORMATION**

1. Engelhard shall preserve all records relevant to this Consent Order at a location designated by it, including copies of all documents or information maintained in any form by it or by its contractors, subcontractors, or anyone else acting on its behalf, for six (6) years after completion of the work ordered. The records referred to in this paragraph include, but are not limited to, sampling results, analyses, chain-of-custody records, manifests, trucking logs, receipts, reports, computer disks, correspondences, and any other documents and draft documents produced pursuant to this Consent Order.
2. Engelhard shall notify EPA not less than thirty (30) days prior to the destruction of any documents referred to in Paragraph 1 above. Upon request by EPA, Engelhard shall provide EPA with the records.
3. Upon request by EPA, Engelhard and/or its contractors shall furnish copies of all records and information relevant to this Consent Order to EPA within a reasonable time. Engelhard may assert a confidentiality claim pursuant to 40 C.F.R. § 2.203(b), if appropriate, covering all or part of any information submitted to EPA pursuant to this Consent

Order. Information claimed to be confidential shall be afforded the protection specified at 40 C.F.R. Part 2, Subpart B. If no such claim accompanies any information submitted to EPA, such information may be made available to the public without further notice to Engelhard. Engelhard shall not assert a confidentiality claim regarding any hydrogeological or analytical data generated pursuant to this Consent Order.

4. Engelhard shall submit, when due, to the EPA Project Manager, a total of seven (7) bound copies and one (1) unbound copy of each submittal required under this Consent Order. Such submittals shall be mailed to:

U.S. Environmental Protection Agency  
Region I  
J.F. Kennedy Federal Building  
Boston, Massachusetts 02203  
Attention: Project Manager

5. The tabulated validated data for any submittals shall be made available to EPA upon request in a mutually agreed upon format including, if requested, computer readable files in a mutually agreed upon format.

**XVII. RESERVATION OF RIGHTS AND NON-RELEASE OF OTHER CLAIMS**

1. Nothing contained in this Consent Order shall be construed to prevent EPA from seeking legal or equitable relief to enforce the terms of this Consent Order or from taking other actions it deems necessary to protect human health and the environment. These

actions include, but are not limited to, seeking further enforcement in Federal District Court pursuant to Section 3008(h)(2) of RCRA, if Engelhard fails to comply with the requirements of this Consent Order within the time frames specified. Pursuant to that Section, EPA may seek penalties of up to \$25,000 for each day of non-compliance.

2. EPA reserves the right to expend and recover funds under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA); to bring "imminent and substantial endangerment" actions under RCRA Section 7003 and/or CERCLA Section 106; to assess penalties for violations of and to require compliance with RCRA requirements under Section 3008(a); to address Releases other than those identified in this Consent Order; to require further study or action under Section 3008(h) of RCRA, as necessary, to respond to any Releases from the Facility, including those addressed in this Consent Order, to protect human health and the environment; and to bring actions as appropriate under any of the other authorities administered by EPA. EPA also reserves the right to bring actions against non-parties, if appropriate.
3. EPA reserves the right to perform any portion of the work agreed to herein or any additional Site characterization, any response/corrective actions it

deems necessary to protect human health or the environment. EPA reserves the right to seek reimbursement from Engelhard for such additional costs incurred by the United States. Notwithstanding compliance with the terms of this Consent Order, Engelhard is not released from any liability for the costs of any response actions taken by EPA.

4. Compliance by Engelhard with the terms of this Consent Order shall not relieve Engelhard of its obligations to comply with RCRA or any other applicable local, state, or federal law.
5. Nothing in this Consent Order shall constitute or be construed as a release from any claim, cause of action or demand in law or equity against any person, firm, partnership, or corporation not a signatory to this Consent Order for any liability it may have arising out of or relating in any way to the generation, storage, treatment, handling, transportation, Release, or disposal of any Hazardous Constituents, hazardous substances, Hazardous Wastes, pollutants, or contaminants found at, taken to, or taken from the Facility.

**XVIII. NO PREAUTHORIZATION OF FUNDING**

Nothing in this Consent Order shall be deemed to constitute any approval or denial of preauthorization of funds under Section 111(a)(2) of CERCLA, 42 U.S.C. § 9611(a)(2).

**XIX. OTHER APPLICABLE LAWS**

All actions required to be taken pursuant to this Consent Order shall be undertaken in accordance with the requirements of all applicable local, state and federal laws and regulations.

**XX. INDEMNIFICATION OF THE UNITED STATES GOVERNMENT**

1. To the extent permitted by law, Engelhard agrees to indemnify and save and hold harmless the United States Government and its agencies, departments, agents and employees, from any and all claims or causes of action arising from or on account of acts or omissions of Engelhard or its agents, independent contractors, receivers, trustees, and assigns in carrying out activities required by this Consent Order.
2. This indemnification shall not be construed in any way as affecting or limiting the rights or obligations of Engelhard or the United States under their various contracts. Nor shall this indemnification be construed as requiring Engelhard to indemnify and save and hold harmless the United States Government, its agencies, departments, contractors, agents, or employees from any and all claims or causes of action arising from willful acts or omissions of the United States Government, its agencies, departments, contractors, agents, or employees.



**XXI. FINANCIAL ASSURANCE**

1. Within thirty (30) days after Engelhard receives written notice of EPA approval of the RFI Proposal in accordance with Section VI above, Engelhard shall provide financial assurance for the performance of the work required under this Consent Order using one or more of the mechanisms allowable under 40 C.F.R. § 265.143(c), (d), (e) or (f). If Engelhard fails to perform any of the terms or conditions of this Consent Order, the financial assurance shall be available to EPA to perform such terms or conditions of this Consent Order provided that, prior to drawing upon any financial assurance instrument, EPA shall notify Engelhard, in writing, of the alleged failure to perform and provide Engelhard with a reasonable period of not less than fifteen (15) days in which to remedy the alleged non-performance.
2. Each year, on the anniversary of the provision of financial assurance, Engelhard shall adjust the amount of financial assurance to reflect the approved completion of construction items and/or any other factors that may bear on the cost of the yet-to-be-completed work that is required under this Consent Order.

**XXII. SUBSEQUENT MODIFICATION**

1. This Consent Order may be amended. Any amendment shall

be in writing and shall be effective on the date on which it is signed by EPA and Engelhard.

2. EPA may, within its discretion, extend approved schedules or deadlines under this Consent Order whenever it deems such extensions appropriate.
3. Any reports, plans, specifications, schedules and attachments or modifications thereto required by this Consent Order are, upon approval by EPA, incorporated into this Consent Order. Any noncompliance with such EPA approved reports, plans, specifications, schedules and attachments shall be considered a failure to achieve the requirements of this Consent Order and may subject Engelhard to the assessment of penalties of up to 25,000 dollars per day, pursuant to Section 3008(h)(2) of RCRA, 42 U.S.C. § 6928(h)(2).
4. No informal advice, guidance, suggestions, or comments by EPA regarding reports, plans, specifications, schedules or any other writing submitted to Engelhard will be construed as relieving Engelhard of its obligation to obtain written approval, if and when required by this Consent Order.

#### XXIII. INCORPORATION AND ENFORCEABILITY OF DOCUMENTS

All attachments and appendices to this Consent Order shall be deemed incorporated into, and made an enforceable part of, this Consent Order.

**XXIV. TERMINATION AND SATISFACTION**

The provisions of this Consent Order shall be deemed satisfied upon Engelhard's receipt of written notice from EPA that Engelhard has demonstrated, to the satisfaction of EPA, that the terms of this Consent Order, including any amendments, have been satisfactorily completed. EPA shall issue such notice after receipt of notice from Engelhard that it has completed the requirements of this Consent Order.

**XXV. SEVERABILITY**

If any provision of this Consent Order, or the application of this Consent Order to any party or circumstances is held to be invalid by any judicial or administrative authority, the application of such provisions to other parties or circumstances and the remainder of the Consent Order shall remain in force and shall not be affected thereby.

**XXVI. SURVIVABILITY/PERMIT INTEGRATION**

Subsequent to the issuance of this Consent Order, a RCRA permit may be issued to the Facility incorporating the requirements of this Consent Order by reference into the permit.

Any requirements of this Consent Order shall not terminate upon the issuance of a RCRA permit unless the requirements are expressly replaced by the requirements in the permit.

**XXVII. EPA REVIEW AND APPROVAL PROCESS**

1. After review of any proposal, plan (except for certain Stabilization plans detailed in Sections I, II and III and the Health and Safety Plan detailed in Section V), report or other item (submission) required by this Consent Order, the Director shall either:

- a. Approve, in whole or in part, the submission;
- b. Approve, in whole or in part, the submission with conditions and/or modifications;
- c. Disapprove, in whole or in part, the submission, notifying Engelhard of deficiencies;
- d. Direct that Engelhard modify the submission to cure the deficiencies; or,
- e. Any combination of the above.

If the Director approves, conditionally approves, or modifies the submission, Engelhard shall proceed to take the action(s) required by the submission, as approved or as consistent with the terms of the conditional approval or modification.

2. If the Director disapproves the submission, the Director shall specify the deficiencies, in writing, and establish a time frame within which Engelhard shall resubmit the proposal, plan, report or other item required by the Consent Order to the Director.

3. If, after resubmission, the Director disapproves the proposal, plan, report or other item required by the

Consent Order, the Director may, within his/her discretion, either require Engelhard to make further modification(s) or make such modification(s) as he/she deems necessary to satisfy the requirements of the Consent Order. In the event that the Director makes such modification(s), the modified submission becomes the approved submission.

4. Initiation of any phase of this Consent Order may be commenced by receipt of notice to such effect from EPA and is not necessarily dependant upon approval of any prior phase. All deliverables, except as otherwise provided herein, are subject to the review and approval provisions set forth in this Section XXVII and all deliverables are subject to the Dispute Resolution provisions set forth in Section XXX of this Consent Order.

#### **XXVIII. STIPULATED PENALTIES**

1. Engelhard agrees to take all measures necessary to perform its obligations under this Consent Order. If Engelhard fails to take or complete any of the actions specified in subsections a. through m. below, within the time periods contained in or approved pursuant to this Consent Order, Engelhard shall pay stipulated penalties in the amounts listed in Paragraph 2 below, unless Engelhard has been prevented or delayed from so acting by a "Force Majeure" event as determined by EPA,

and as specified in Section XXIX below:

- a. Submittal of the Stabilization Plan, Conceptual Designs, Confirmatory Sampling Plans, or Operation and Maintenance Plans for Stabilization Measures, Final Designs for Stabilization Measures or Stabilization Reports in accordance with Sections I-IV of this Consent Order.
- b. Submittal of the RFI Proposal in accordance with Section V of this Consent Order;
- c. Submittal of the Phase I Interim Report and Phase II Proposal in accordance with Section VII of this Consent Order;
- d. Submittal of the RFI Report in accordance with Section IX of this Consent Order;
- e. Submittal of the Media Protection Standards Proposal in accordance with Section XI of this Consent Order;
- f. Submittal of any supplemental RFI reports required under Section IX of this Consent Order;
- g. Submittal of an Interim Measures Plan or Report, if required under Section XII of this Consent Order;
- h. Submittal of any modified reports or proposals required under this Consent Order;
- i. Failure to comply with the Site access provisions of Section XV of this Consent Order;

- j. Failure to comply with the financial assurance provisions of Section XXI of this Consent Order;
- k. Failure to begin construction for Stabilization Measures;
- l. Failure to begin operation of Stabilization Measures; or
- m. Failure to achieve the following Stabilization performance standards:
  - For soils at AOC B: the specific performance standards approved by EPA, only after an additional Stabilization measures workplan has been implemented;
  - For roof drain runoff at AOC #13: the specific performance standards approved by EPA, only after an additional Stabilization measures workplan has been implemented;
  - For contaminated Ground Water migrating from the Facility: the general performance standard in paragraph I.A.3.a. and the specific performance standards approved by EPA, only after an additional Stabilization measures workplan has been implemented; or
  - For public access at AOC #13: the general performance standards.

- 2. For any violation of the requirements listed in Paragraph 1 above, Engelhard shall pay stipulated

penalties in the following amounts, according to the provisions in Paragraph 5 below:

<u>Amount/Day</u>	<u>Period of Noncompliance</u>
\$2,500	1st through 7th calendar day
\$3,750	8th through 14th calendar day
\$5,000	15th calendar day and beyond

3. If Engelhard fails to complete any Phase I and/or Phase II tasks in accordance with the schedules approved pursuant to Sections V. and VII. above, Engelhard shall pay, upon written demand by the Director, \$1,000 for each and every day of such noncompliance into an escrow account. The escrow account shall be administered by a neutral third party and shall be payable, with interest, upon demand by Engelhard. Engelhard shall demand payment of any funds in the escrow account only after having submitted the RFI Report in accordance with Section IX above. Engelhard shall then distribute such funds in accordance with the following provisions:
  - a. If Engelhard meets the deadline(s) for the Phase I Report and Phase II Proposal and/or the RFI Report established in Sections VII and IX, respectively, any amounts in the escrow account associated with the met deadline(s) shall be retained by Engelhard.
  - b. If Engelhard misses the deadline(s) for the Phase I Report and Phase II Proposal and/or the RFI



Report, any amounts in the escrow account associated with the missed deadline(s) shall be paid to the United States as provided in paragraph 5. below.

4. If Engelhard fails to comply with the requirements specified below, within the applicable time periods, Engelhard shall pay stipulated penalties in the amount of \$1,000 for each and every day of such non-compliance:
  - a. Failure to submit progress reports on schedule;
  - b. Failure to comply with the requirements of Section XIV (Sampling); or
  - c. Failure to comply with Section XVI (Retention and Availability of Information).
5. Stipulated penalties under this Section shall be paid to the United States within thirty (30) days after written demand by EPA. Payments owed to EPA under this Section shall be paid by cashier's or certified check, payable to the Treasurer, United States of America. Engelhard shall note on this check the docket number of this Consent Order. The check shall be sent to:

EPA - Region I  
P.O. Box 36019M  
Pittsburgh, PA 15251

At the time of payment, Engelhard shall send a notice of such payment to the Regional Hearing Clerk at:

U.S. Environmental Protection Agency  
JFK Federal Building, RCG  
Boston, MA 02203  
ATTN: Regional Hearing Clerk

6. The stipulated penalties set forth in this Section do not preclude EPA from pursuing any other remedies or sanctions which may be available to EPA by reason of Engelhard's failure to comply with any of the requirements of this Consent Order, nor shall payment of said penalties relieve Engelhard of the responsibility to comply with the requirements of this Consent Order.
7. For purposes of Paragraph 1 above, Engelhard's failure in the initial submittal of any proposal and/or report required herein to address in good faith any specifically required component of that proposal and/or report shall constitute a violation of this Consent Order.
8. For purposes of Paragraph 1 above, if after the Director has approved any proposal and/or report with conditions or disapproved any proposal and/or report and specified the deficiencies therein, Engelhard thereafter fails to submit a modified proposal and/or report within the specified timeframe which satisfactorily addresses the specified conditions or deficiencies, such failure shall constitute a violation of this Consent Order.
9. Issuance and receipt of a notice of noncompliance is

**XXIX. FORCE MAJEURE**

1. Engelhard shall perform all requirements under this Consent Order within the time limits specified, approved, or established herein. However, if any circumstance arises which has caused or will cause a delay in meeting the time limits or schedules for performance of any of the requirements, Engelhard shall submit written notification to EPA no later than ten (10) days after the date Engelhard first concludes that such circumstance has caused or will cause a delay or prevents Engelhard from meeting the time limits or approved schedules. Engelhard shall describe in detail the length or anticipated length of the delay or circumstance which prevents performance, the measures taken or to be taken to prevent or minimize the delay or circumstance which prevents performance, and the schedule for implementation of the measures to be taken. Engelhard shall take all efforts to prevent or minimize any delay and to eliminate any circumstance which prevents or might prevent the requirements under this Consent Order from being performed. Failure to notify EPA in writing within ten (10) days of first conclusion by Engelhard that performance of any requirement is prevented or of any such actual or anticipated delay, shall constitute a waiver of any "Force Majeure" claim.

2. If the delay in meeting the time limit or approved schedule for performance of the requirements specified herein will be or has been caused by an act of God, fire, flood or vandalism, or other circumstance beyond the control of Engelhard or its contractors, subcontractors, or laboratories, then the deadline for that measure shall be extended for a period required to compensate for the delay, but in no event shall that extension be longer than the delay actually caused by such circumstance. By way of illustration, and without limiting the generality of the foregoing, examples of potential "Force Majeure" events under this section include extreme weather, unforeseeable geologic conditions, or equipment failure not reasonably foreseeable or preventable. In the event that the parties agree that a delay is or was warranted, the parties shall stipulate to an extension of the particular deadline affected and, if necessary, any succeeding deadline affected by such delay. In the event that the parties cannot agree as to whether a delay is or was warranted, such disagreement shall be subject to the Dispute Resolution provisions of this Consent Order, and Engelhard shall demonstrate that the event was a "Force Majeure" event, that the delay was caused by the "Force Majeure" event, and that the duration of the delay is or was warranted under the

circumstances.

3. Financial or economic conditions, or changes in the same, or increased costs or expenses associated with the implementation of actions called for by this Consent Order shall not constitute a "Force Majeure" event.

**XXX. DISPUTE RESOLUTION**

1. In the event that Engelhard disagrees, in whole or in part, with EPA's disapproval or modification of any submission or any other decision or directive made by EPA pursuant to this Consent Order, Engelhard shall notify EPA of its objections by providing EPA with a written statement of position within fourteen (14) days of receipt of EPA's disapproval or modification or any other decision or directive. Engelhard's statement of position shall set forth the specific matters in dispute, the position that Engelhard asserts should be adopted as consistent with the requirements of this Consent Order, the basis for Engelhard's position, and shall include any supporting documentation.
2. EPA and Engelhard shall have an additional fourteen (14) days from EPA receipt of Engelhard's statement of position to meet or confer to attempt to resolve the dispute. If agreement is reached, the resolution shall be reduced to writing, signed by representatives of each party and incorporated into this Consent Order.

Engelhard shall implement the same in accordance with such agreement.

3. If EPA and Engelhard are not able to reach agreement within the fourteen (14) day period, the Director of the Waste Management Division will thereafter notify Engelhard, in writing, of his decision on the dispute and Engelhard shall comply with the terms and conditions of EPA's decision on the dispute. The decision shall be incorporated into this Consent Order and any requirements thereof shall be considered to be requirements of this Consent Order.
4. Notwithstanding the invocation of this dispute resolution procedure, Engelhard shall proceed, at the direction of EPA, to take any action required by those portions of the submission and of the Consent Order that EPA determines are not substantially affected by the dispute.
5. The time periods established within paragraphs 1 and 2 above, may be extended by EPA upon notice to Engelhard or, at EPA's discretion, upon the request of Engelhard where good cause is shown.

**XXXI. EFFECTIVE DATE**

This Consent Order shall become effective on the date it is signed by the Regional Administrator.

Date: 9/9/93

Merrill S. Hohman  
Merrill S. Hohman  
Director  
Waste Management Division  
U.S. Environmental Protection  
Agency

Date: 9/7/93

Andrea Simpson  
Andrea Simpson  
Assistant Regional Counsel  
U.S. Environmental Protection  
Agency

Date: 27 August '93

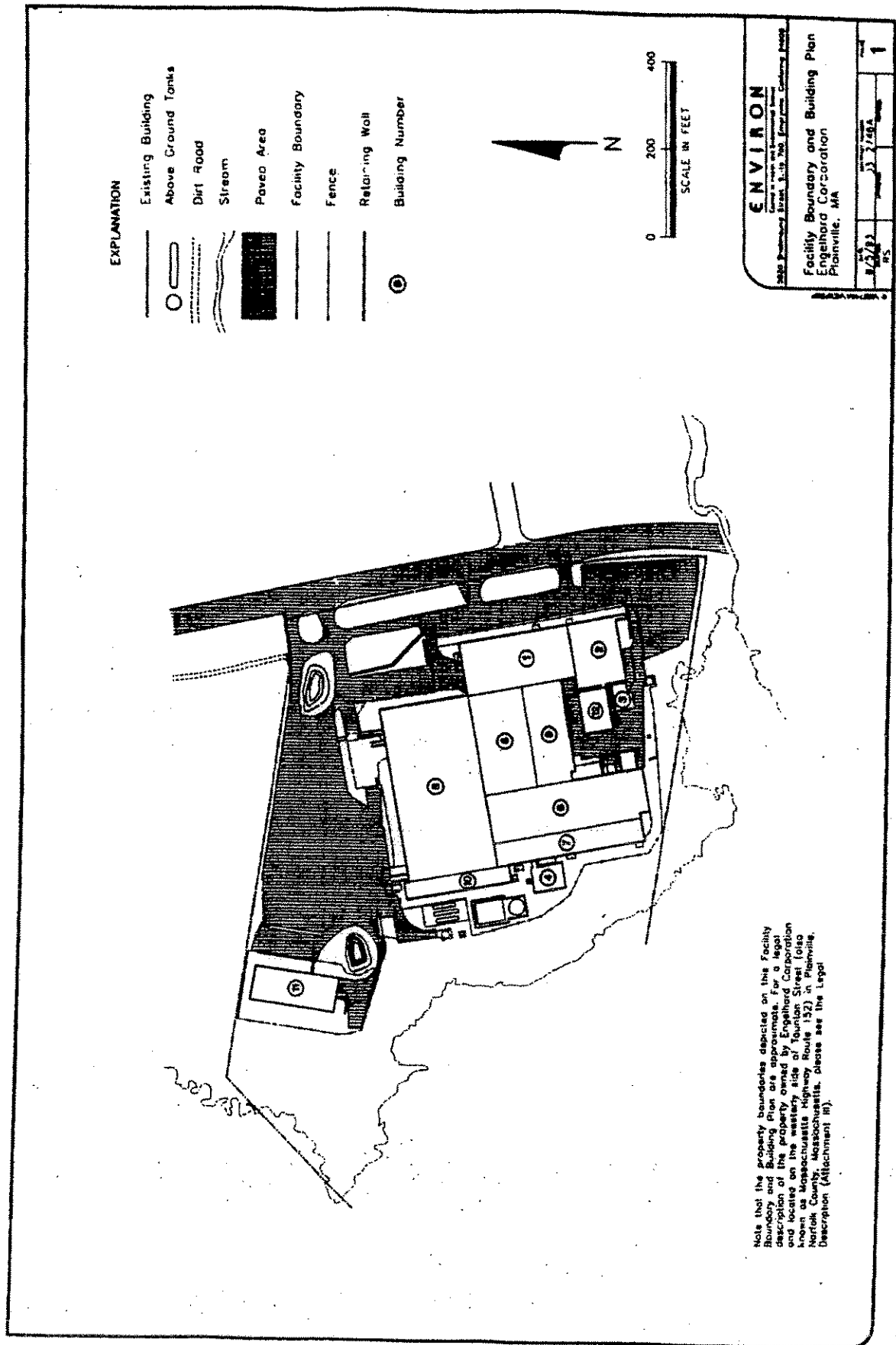
Durland Evans  
Durland Evans  
Vice President and General Manager  
EMG North America  
Engelhard Corporation

IT IS SO ORDERED.

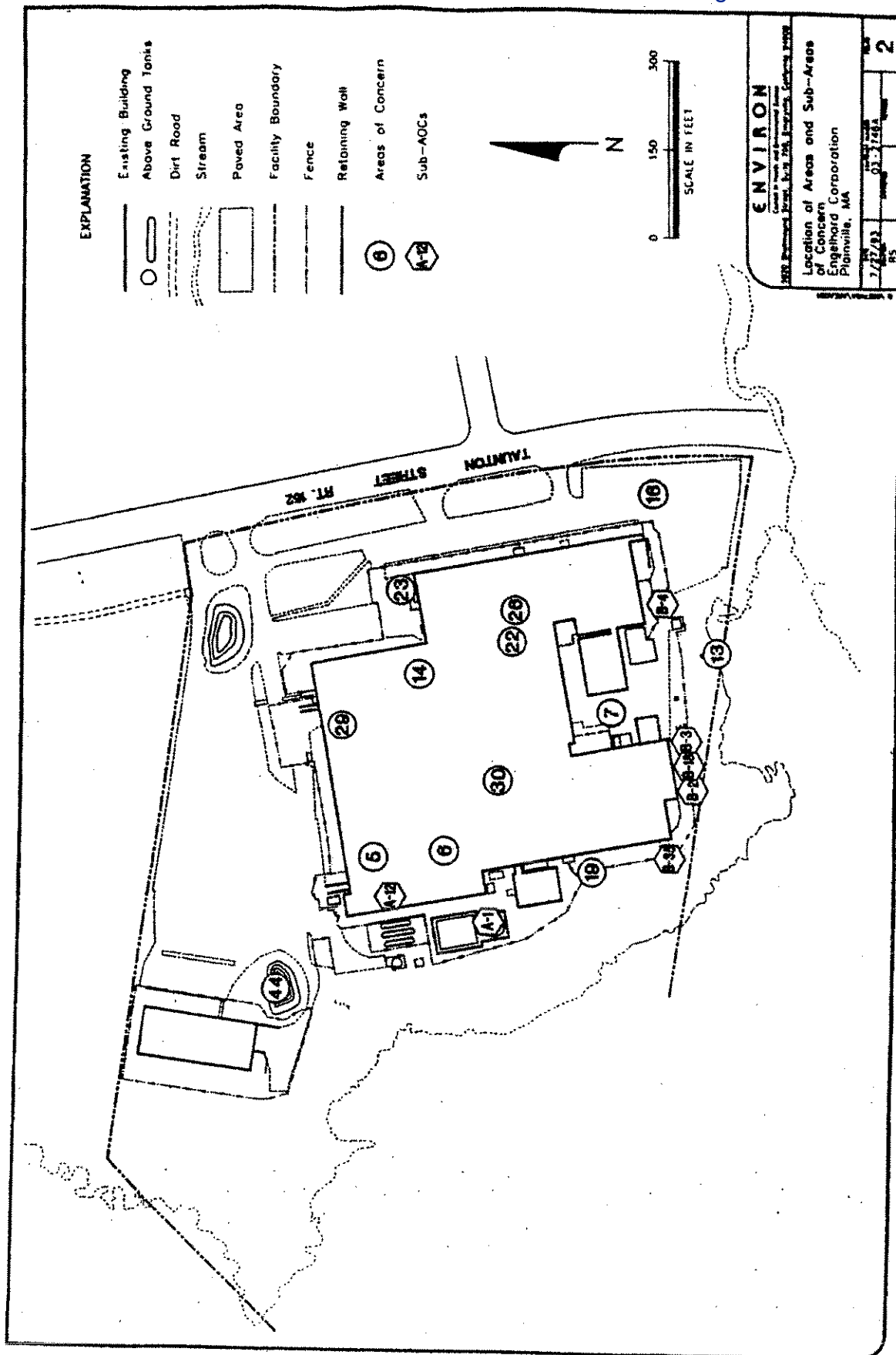
Paul G. Keough

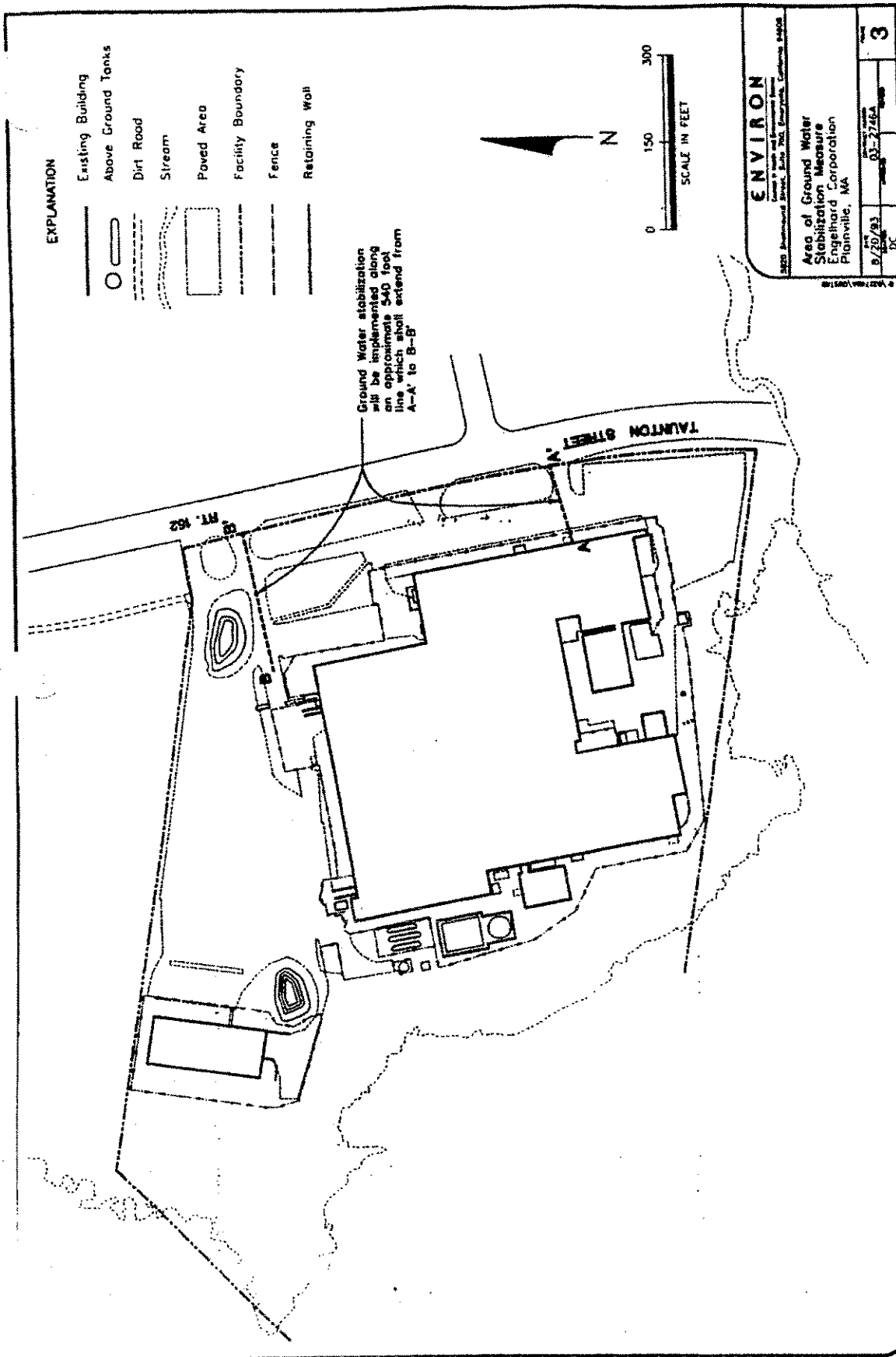
Paul G. Keough  
Acting Regional Administrator, Region I  
U.S. Environmental Protection Agency

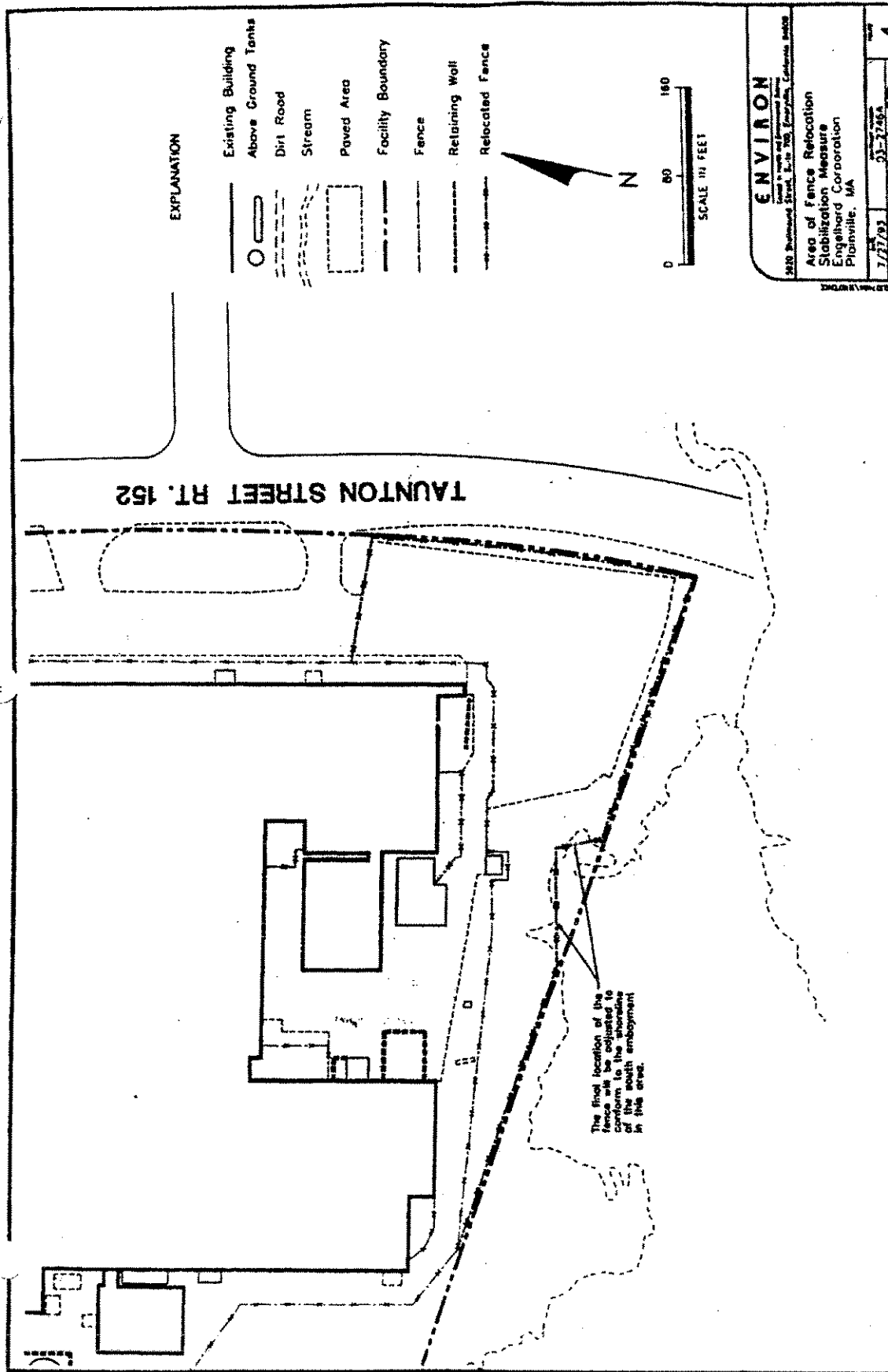
Sept 9, 1993  
Date











## ATTACHMENT I

## AREAS OF CONCERN AND MEDIA TO BE INVESTIGATED

<u>AOC/SUB AOC</u>	<u>GROUND WATER</u>	<u>SOIL</u>	<u>SURFACE WATER</u>	<u>SEDIMENT</u>
A-1	X	X		
B-2	X	X		
B-3	X	X		
B-4	X	X		
5	X	X		
6	X	X		
7	X	X		
A-12	X	X		
13	X	X	X	X
14	X	X		
16	X	X		
B-18	X	X		
19	X	X		
22	X	X		
23	X	X		
26	X	X		
29	X	X		
30	X	X		
B-35	X	X		
44	X	X	X	X

X = Media to be investigated

Attachment II

**TECHNICAL AGREEMENT**

**Field Investigations to Support the  
RCRA Facility Investigations and Implementation of  
Stabilization Measures at the  
Engelhard Facility, Plainville, MA**

Engelhard has agreed to implement certain Stabilization measures and conduct certain field investigations at the Engelhard Facility in Plainville, Massachusetts (the "Facility") pursuant to the RCRA Facility Investigation ("RFI") which is contained in the Consent Order, RCRA Docket No. I-92-1051. A general description of field investigation requirements to support the Stabilization measures and the RFI is provided in the Consent Order.

This Technical Agreement includes a preliminary scope of certain aspects of the field investigation to be conducted under the Consent Order and is incorporated by reference into the Consent Order. The scope of the RFI may not be limited to the scope outlined in this Technical Agreement. EPA will further review the scope of the RFI at the time Engelhard submits the RFI proposal. Based on this review, the scope of the RFI may be modified.

**Division of RFI Field Investigations into Two Phases**

The field investigations to support the RFI will be conducted in two phases. Phase I will include testing of soil, Ground Water, surface water, fish tissue, and sediments to define contaminated areas and media of concern. Phase I will include construction of additional Monitoring Wells, soil and soil gas sampling

and analysis, two rounds of ground-water monitoring (including testing for Appendix IX constituents in ground-water samples from selected wells), surface water monitoring, and sediment and fish tissue sampling and analysis. Based on a preliminary review by EPA of data needs for completion of the RFI, the Phase II proposal will include two (2) additional rounds of ground-water and surface water monitoring, and pilot testing of a soil gas treatment system to support future analysis of treatment technologies. The extent of additional testing or data collection in Phase II depends on findings of Phase I studies.

#### Coordination of Environmental Data Collection Programs

Data defining the nature and extent of contamination in soil, Ground Water, surface water, sediment and fish tissue will be collected during and following the implementation of the Stabilization measures described in the Consent Order and during the RFI. To the extent possible, the confirmatory sampling for Stabilization, as required in Section II of the Consent Order, will be incorporated into the RFI sampling program. To the extent possible, the schedule for the field investigations in the RFI Proposal will be coordinated with the schedule for confirmatory sampling and implementation of the Stabilization measures to achieve this end. Data from this confirmatory sampling will be considered along with other Site data that describes current conditions at the Facility and media affected by Releases of Hazardous Waste and/or Hazardous Constituents from AOCs and sub-AOCs at the Facility to establish the baseline conditions of the Facility in the RFI and the risk assessment.

Establishment of Background Environmental Data

Soils:

A statistically significant number of soil samples should be collected to characterize the Background levels of Hazardous Wastes and/or Hazardous Constituents in soils at the Facility. The characterization of Background soils will be specific to potential Constituents of Concern in soils at the AOCs identified for investigation in the Consent Order and any other AOCs added to Attachment I and may involve sampling of off-site soils, if appropriate.

Surface Water and Sediments:

Natural storm water drainage patterns and the flow patterns in Turnpike Lake will be considered in establishing Background sampling locations for surface water and sediments in Turnpike Lake and the area east of Route 152. Background surface water quality will be established based on four (4) rounds of testing during the RFI. Background sediment quality will be based on one or two (2) rounds of sampling.

Ground Water:

Existing well MW7 is appropriately located to be used in a Background sampling program in the overburden zone.

A Background bedrock well will be constructed near well MW7. Well MW13 may be considered as a Background bedrock well depending on demonstration of vertical flow

potential and constituent concentrations in comparison to other Background data. The need for additional Background wells will be evaluated as part of the RFI proposal.

Background ground-water quality will be based on four (4) rounds of ground-water quality tests, and any other historical ground-water data that is demonstrated to be representative of Ground Water, based on approved sampling protocols.

Additional Studies Under the RFI:

Ground Water:

Additional Monitoring Wells will be constructed in Phase I of the RFI, including, but not limited to, the following:

1. A new well cluster (overburden and bedrock) between wells MW4 and MW5.
2. An overburden well near AOC No. 12.
3. A bedrock well in the courtyard area near well MW6 to define vertical flow potential; an additional overburden well may also be constructed in AOC No. 7, subject to Engelhard gaining access to an appropriate drilling location.
4. A bedrock well near well MW2; repair of the casing for well MW2.
5. A well(s) to define the southern boundary of the plume in the vicinity of wells MW11/MW10.
6. A well cluster on the northern boundary of the drive-in property located northeast of the Facility.
7. A well cluster on the northern portion of the Facility to define the northern



boundary of the plume.

8. A well cluster located between well clusters 20 and 24.
9. Observation/Monitoring Wells along the stream east of Route 152 and at the rear of the drive-in property to define the discharge boundary of the plume.
10. Operational Observation Wells to monitor the performance of the ground-water Stabilization measure.
11. Appendix IX testing of Ground Water in four (4) to five (5) well clusters.
12. Four (4) rounds of ground-water testing will be conducted in the RFI (two (2) rounds each in Phases I and II), using the approved sampling protocol.
13. Installation of additional wells may be required if deemed necessary by EPA.

Soils:

Additional testing of soils in Phase I of the RFI will include, but not be limited to, the following:

Sub AOCs B-2, B-3, B-4, B-18, B-35 and AOC 7

1. Additional shallow soil samples will be collected to define the boundary of affected surface soils.
2. Additional soil borings will be drilled to define the potential for vertical migration of Hazardous Waste and/or Hazardous Constituents in soil; a minimum of one boring will be drilled in each AOC or sub-AOC; historical data will also be considered in designing the soil sampling program.
3. Sampling will be conducted to determine

the vertical profile and volume of contaminated soils.

4. Any TCLP testing of soils will be limited to soils which may potentially be moved outside an AOC or removed from the Facility.
5. Chemical testing of soils in the sub-AOCs will focus primarily on inorganics. Organics testing will also be included for soil collected within AOC No. 7.

AOC Nos. 5, 6, 22, 29, 30 (beneath building)

At least one soil boring will be drilled in each AOC to establish the contaminant concentration(s) in soil and the presence/absence of free product in the overburden zone. The boundary of each AOC will be further established by soil gas tests in Phase I. Pilot testing of soil gas extraction systems will be performed on selected AOCs in Phase II. The extent of any additional soils testing in Phase II depends on the findings of Phase I studies. Soil testing in Phase II will focus on the collection of data necessary for the development of potential corrective measures.

AOC Nos. 5, 14, 26 (beneath building)

1. At least one soil boring will be drilled in each AOC to establish Hazardous Waste and Hazardous Constituent Concentrations in soil and to determine the potential for migration of such wastes and/or

constituents into Ground Water. If it is determined that Hazardous Wastes and/or Hazardous Constituents have been released into Ground Water, the impact of such wastes and/or constituents on ground-water quality shall be assessed. Engelhard's ability to gain access to each AOC will be considered in finalizing the drilling program.

2. Additional soils testing in Phase II depends on results of soils and ground-water tests in Phase I. EPA may require additional testing of soils in Phase II if the Phase I testing results indicate that there is a potential for migration of contaminants from an AOC.

Sub-AOCs 1 and 12

1. At least one soil boring will be drilled in Phase I within or downgradient from each of the former frog ponds and downgradient of the former regenerate UST and sumps. Soils testing will include metals, organics and cyanide. Engelhard's ability to gain access to each area will be considered in finalizing the drilling program.
2. The extent of any additional testing of soils in Phase II depends on the results of soils and ground-water tests in Phase I. EPA may require additional testing of soils in Phase II to define the nature and extent of contamination if the Phase I testing results indicate that there is a potential for migration

of contaminants from an AOC.

Surface Water and Sediments:

Additional tests of surface water and sediment will be conducted in the RFI including, but not limited to, the following:

1. Additional testing of fish tissue from Turnpike Lake will be conducted to establish Background conditions and to monitor any Facility impacts on fish. The testing of fish tissue will be similar in scope to the prior testing performed by Engelhard at the Facility.
2. Chemical testing of sediments in Turnpike Lake in AOC 13 and near Sub-AOCs A-1 and A-12 will be performed to define any areas of the Lake that have been affected by contaminated storm water discharges or other Releases of Hazardous Wastes and/or Hazardous Constituents from AOCs; chemical testing of sediments in the Lake will begin in the vicinity of the potential points of discharge(s) and then work outward into the Lake until the boundary of the AOC is defined.
3. Chemical testing of sediments will focus primarily on metals.
4. Chemical testing of stream sediments and surface water east of Route 152 will be performed to define the nature and extent of contamination caused by Releases of Hazardous Wastes and/or Hazardous Constituents from the Facility.
5. Background sediment/surface water

ATTACHMENT III

Legal Description of Facility

Those certain parcels of land, with the buildings and improvements thereon, located on the westerly side of Taunton Street (also known as Massachusetts Highway Route 152) in Plainville, Norfolk County, Massachusetts, being bounded and described as set forth in the following instruments:

1. Deed from Phibro Corporation to Engelhard Corporation dated November 23, 1981 and recorded with the Norfolk County Registry of Deeds in Book 5949, Page 522.

2. Deed from the Town of Plainville to Engelhard Industries Division of Engelhard Corporation dated July 9, 1990, and recorded with said Deeds in Book 8685, Page 581, which land is also shown on a plan entitled "Land To Be Conveyed By The Town of Plainville to Engelhard Industries In Plainville, Massachusetts", E. Otis Dyer, Surv'r., Rehoboth, Massachusetts, June 10, 1983, recorded as Plan No. 527 of 1990 in Plan Book 393.

3. Deed from William E. Moreshead and Marlene J. Moreshead to Engelhard Industries, Inc. dated February 2, 1966 and recorded with said Deeds in Book 4328, Page 400.

To the best of Engelhard Corporation's knowledge, the land described in the above-referenced deeds is shown on that certain Facility Boundary and Building Plan dated August 5, 1993, prepared by Environ for Engelhard Corporation, a copy of which is attached to this EPA Administrative Consent Order (RCRA Docket No. I-92-1051) as Figure No. 1.

## **Appendix I**

### **Information Requirements of the RFI Proposal for the Environmental Setting, Source and Contamination Characterization**

#### **A. Field Work/Environmental Setting**

Proposals and completed tasks shall include a description of the procedures Engelhard uses or intends to use to gather data sufficient to characterize Site conditions. At a minimum, descriptions must show how the proposed or completed field work provides a reliable indication of Site conditions. Descriptions shall include:

##### **1. Soils and Subsurface Investigations**

- a. The number and location of continuous test borings, test pits, or soil sampling points in relation to the AOC or sub-AOC;
- b. A justification for the horizontal spacing of the proposed boring network, test pits and/or sample points based on the complexity of the Site geology and other relevant Site characteristics such as contaminant profiles and considering other subsurface geophysical programs proposed by Engelhard (i.e., seismic, ground penetrating radar, etc.);
- c. The proposed procedures and depths for conducting each boring and sampling point and a justification showing that the proposed procedures will provide a representative sample of soil, based on the geologic characteristics of the Site and the parameters for which each sample is to be analyzed; and
- d. The proposed design and procedures for each geophysical transect and a justification showing how the proposed design will provide a representative indication of the subsurface conditions of the Site of each analysis.

##### **2. Ground-Water Investigations**

- a. The number and location of Observation Wells and/or piezometers in relation to the AOC or sub-AOC and a justification for their placement. This justification shall be based on the complexity of the Site hydrogeology, relevant Site characteristics, and other hydrogeologic investigation programs proposed by Engelhard;
- b. A description of, and justification for, the

proposed piezometer and well-intake design, including depth, screen slot size, length, and diameter, filter-pack materials to minimize siltation, method of filter-pack emplacement, and well construction material;

- c. The proposed Monitoring Well installation and development procedures, and a justification therefor;
- d. The proposed methods that will be used to seal the well from surface runoff and to prevent downward migration of contaminants along the well annulus and upward migration of Ground Water below the well screen;
- e. The proposed design must be equipped with a locking cap to protect the well from potential harm, including, without limitation, that which may be caused by automobile traffic or construction equipment; and
- f. The proposed design of slug and/or pumping tests, as appropriate to determine hydraulic conductivity. The design shall include the reference for the method, a justification of the method, and the location of the test(s).

3. Surface Water and Sediment Investigations

- a. A description of the methods for determining temporal and permanent surface water bodies including:
  - i. the number and location of measurements and transects to determine the location, elevation, surface area, depth, width, volume, freeboard, seasonal fluctuations in flow rate, flood potential and state stream classification for rivers, streams, ditches, channels and impoundments as appropriate;
  - ii. the methodology to determine drainage patterns;
  - iii. the number and location of measurements to determine deposition area, thickness profile, and sediment transport; and
  - iv. the number and location of measurements and the methodology to determine physical parameters (e.g., grain size, density, etc.).
- b. A description of surface water and sediment

characteristics, including, without limitation, the following:

- i. deposition area;
  - ii. physical and chemical parameters (e.g., grain size distribution, density, total organic carbon content, ion exchange capacity, pH); and
  - iii. seasonal variations in sediment transport.
4. Climatic Investigations
- a. The methodology to be used to determine the precipitation quantities and the temperatures at the Site and to compare to annual and monthly average and extremes for the preceding thirty years; and
  - b. The number and location of measurements of wind speed and direction relative to each AOC and to the Facility boundaries.



## Appendix II

### Information Requirements of the RFI Proposal for the Sampling and Analysis Program

#### A. Sampling and Analysis (General)

Sampling and analysis plans must be capable of yielding representative samples. The proposed sampling programs shall document the methodology to be used in obtaining the data necessary to provide the information required. The following elements are required, without limitation, of sampling plans, and must be specific, as applicable, for each media to be sampled and, as applicable, to field measurements.

1. At a minimum, proposals and completed tasks shall follow the specifications of the sampling plan which shall include the following:
  - a. The methodology for measuring all necessary ancillary data;
  - b. Conditions under which sampling shall be conducted, and that ensures representative sampling of worst-case conditions (e.g., highest concentrations);
  - c. The methodology for determining which parameters are to be measured and where, and as required in Appendix II.C;
  - d. A description and justification for the proposed types of samples (e.g., grab samples) and number of samples to be collected;
  - e. The methodology to determine the number of field measurements necessary to give statistically significant results;
  - f. Procedures and forms for recording raw data and the exact location, time and Facility-specific considerations associated with the data acquisition;
  - g. Field screening of samples (OVA, HNU, XRF, etc.), and documentation of screening methods;
  - h. Proposed procedures for collecting replicate measurements;
  - i. The sample collection frequency and length of sampling period and justification therefor;

- j. Procedures for decontamination of sampling equipment between sampling events;
- k. Proposed analytical techniques and detection limits, to conform to EPA-approved analytical methods (e.g., Test Methods for Evaluating Solid Waste, SW 846, Third Edition, September 1986) and established in SW 846 including:
  - i. the scope of application of the procedure;
  - ii. a sample matrix;
  - iii. any potential interferences;
  - iv. the precision and accuracy of the methodology;
  - v. data reduction, validation and reporting;
  - vi. proposed internal quality control checks, laboratory performances and systems audits including audit frequency; and
  - vii. proposed preventive maintenance procedures and schedules.
- l. Sample handling and preservation techniques (e.g., holding times and sample containers), including provisions for field-filtration of samples as appropriate;
- m. Field and laboratory QA/QC including procedures for calibrating field devices and for documenting calibration and results;
- n. Provisions for providing timely notification of each sampling event to EPA and for providing EPA with split samples;
- o. Proposed chain of custody procedures including provisions to standardize field tracking report forms, to establish sample custody in the field prior to shipment, and containing all information necessary for effective sample tracking by including:
  - i. identification of a responsible party to act as sample custodian at the laboratory facility authorized to sign for incoming field samples, obtain documents of shipments and verify the data entered onto the sample custody records;

- ii. provisions for a laboratory sample custody log consisting of serially numbered standard lab-tracking report sheets; and
- iii. laboratory sample custody procedures for sample handling, storage and disbursement for analysis.

**B. Sampling and Analysis [Media Specific Protocol]**

1. At a minimum, the sampling parameter proposal shall include a sufficient number of complete Appendix IX analyses to characterize the soil. Additionally, it shall include a list of sampling parameters to be tested for at each AOC and sub-AOC and each media of concern listed or proposed to be listed in Attachment I. The soil sampling specifically shall follow the specifications developed from Section A.2 of Appendix I and Section A of Appendix II and shall also include:
  - a. The proposed procedures for obtaining soil samples, and a justification showing the proposed procedures will provide a representative sample of soil, based on the geologic characteristics of the site and the parameters for which each sample is to be screened and analyzed;
  - b. Procedures to verify whether or not contamination has occurred; and
  - c. A proposed method for data organization and presentation.
2. At a minimum, proposed ground-water sampling specifically shall follow the specifications developed from Section A.2 of Appendix I and Section A of Appendix II and shall also include:
  - a. Well evacuation procedures, including volume to be evacuated prior to sampling and handling procedures for purged well water;
  - b. Sample withdrawal techniques and sampling equipment and materials (tubing, rope, pumps, etc.) shall be selected to yield representative samples in light of the parameters to be monitored. The sampling protocol shall include field measurements of pH, conductivity and temperature for each sample, and a check to determine whether immiscibles are present in wells;
  - c. Procedures for measuring ground-water elevations within a 24 hour period prior to each sampling

- event and a methodology to screen for anomalous readings and to screen for tidal influence and barometric pressure effects, if any; and
- d. Procedures to verify whether or not contamination has occurred, including:
    - i. a proposed method (statistical or otherwise) for comparison of upgradient and downgradient well water that provides a reasonable balance between the probability of falsely identifying and failing to identify contamination; and
    - ii. a proposed method for data organization and presentation.
  3. At a minimum, proposed surface water and sediment sampling specifically shall follow the specifications developed from Section A.3 of Appendix I and Section A of Appendix II and shall also include:
    - a. Sample withdrawal techniques and sampling equipment and materials (dippers, scoops, rope, pumps, etc.) shall be selected to yield representative samples in light of the parameters to be monitored for. The sampling protocol shall include field measurements of pH, conductivity, and temperature for each sample and also a check to determine whether immiscibles are present;
    - b. Procedures for measuring surface water elevations within a 24 hour period prior to each sampling event and a methodology to measure water levels during high flow episodes; and
    - c. Procedures to verify whether or not contamination has occurred, including:
      - i. a proposed method (statistical or otherwise) for comparison of upgradient and downgradient water quality that provides a reasonable balance between the probability of falsely identifying and failing to identify contamination; and
      - ii. a proposed method for data organization and presentation.
  4. At a minimum, air sampling specifically shall consider the information developed from Section A.4 of Appendix I and Section A of Appendix II and shall also include:
    - a. A plan for an ambient air modeling program

designed to determine maximum ambient concentrations and/or maximum impact locations of air contaminants at the Facility boundaries. Models and modeling protocol proposed shall be in accordance with the Superfund Public Health Evaluation Manual (October 1986) and the "Rapid Assessment of Exposure to Particulate Emissions from Surface Contamination Sites" (Cowherd, et al., 1984);

- b. A plan for the design and installation of an ambient air monitoring network capable of determining the emission rate and concentration of hazardous waste and/or constituents in the ambient air. This plan shall include the following elements:
  - i. a proposal for direct measurement to screen for a possible air release at the unit using such technologies as stain detector tubes or portable survey instruments (Photovan 10A10);
  - ii. a discussion of the proposed methodology for determining the location of each monitor to measure for maximum impact of contaminants on-site, at the Facility boundary, and off-site providing access is granted to the owner/operator;
- c. A methodology for reporting releases to EPA. At a minimum, the report shall include all raw data collected during the investigations which indicates a release, all calculations performed therewith, and an interpretation of the data indicating the severity of the release;
- d. A plan which sets action levels for the Hazardous Wastes and/or Hazardous Constituents potentially released from the AOCs listed in Attachment I, and responses to those levels if and when they are exceeded. In the case that the action levels are exceeded, the plan shall provide for the coordination with appropriate city officials to safeguard workers and the local population; and
- e. A proposed method for data organization and presentation.

#### C. Sampling Parameters

The RFI Proposal shall include proposed sampling parameters for media specific sampling programs designed to measure the concentration and extent of Hazardous Waste and/or Hazardous Constituents released from the AOCs and sub-AOCs listed in

Attachment I or proposed to be listed to Attachment I into the Ground Water, soil, surface waters, bedrock, sediments and air.

1. At a minimum, the sampling parameter proposal shall include a sufficient number of complete Appendix IX analyses to characterize the Ground Water. Additionally, it shall include a list of sampling parameters to be tested for at each AOC and each media of concern listed or proposed to be listed in Attachment I. The sampling parameters shall be chosen from Appendix IX and include parameters for each AOC based on a consideration of the following to the degree that they differ:
  - a. Data generated pursuant to Section I.D.2. concerning the types, quantities and characteristics of wastes managed at the Facility;
  - b. The results of the Appendix IX analyses;
  - c. Known or suspected natural variation of the parameters in Background samples from each media;
  - d. Detection limits for the parameters in each media; and
  - e. Suitability of each parameter (as appropriate) for use as an indicator during the contamination characterization of Section I.D.3.
2. In addition to the parameters from the above Section, ground-water sampling parameters shall also be sufficient to characterize the specific chemistry of Ground Water at the Facility, including but not limited to the major anions and cations that make up the bulk of dissolved solids in water (i.e.,  $\text{Cl}^-$ ,  $\text{Fe}$ ,  $\text{Mn}$ ,  $\text{Na}^+$ ,  $\text{SO}_4^{2-}$ ,  $\text{Mg}^{2+}$ ,  $\text{K}^+$ ,  $\text{NO}_3^-$ ,  $\text{PO}_4^{3-}$ ,  $\text{H}_2\text{SiO}_3$ ,  $\text{NH}_4^+$ ), pH, specific conductance, and total organic carbon.
3. In addition to the parameters from Section C.2. above, surface water sampling parameters shall also be sufficient to characterize the chemistries of the surface water and sediments. This includes, but is not limited to, the pH, total dissolved solids, total suspended solids, biochemical oxygen demand, alkalinity, conductivity, dissolved oxygen profiles, nutrients ( $\text{NH}_3$ ,  $\text{NO}_3^-/\text{NO}_2^-$ ),  $\text{PO}_4^{3-}$ , chemical oxygen demand, total organic carbon and specific contaminant concentrations, as applicable.
4. The air quality characterization shall be determined by the contaminants detected from Appendix IX analyses in the soil, surface water and Ground Water to determine

if any releases have occurred from the AOCs and sub-AOCs listed in Attachment I.

5. Engelhard shall justify its list of sampling parameters for each AOC and sub-AOC listed in Attachment I. If Engelhard proposes indicator parameters during contamination characterization, one indicator must be shown to be representative of substances at least as mobile as the most mobile constituent that could be derived from the Facility's waste, and which is not a constituent from other sources, and another must be shown to migrate at least as slowly as the least mobile constituent that could be derived from the Facility's waste and which is not a constituent from other sources. Final determinations on the extent of contamination are to be based on a complete analyses of all known waste constituents.



### Appendix III

#### Health and Environmental Risk Assessment

##### A. Objectives

The purpose is to complete a baseline Health and Environmental Risk Assessment in conjunction with the RFI. After evaluation of the field investigation information and establishment of the data base for the Site, a Baseline Risk Assessment should be conducted. The objective of this assessment is to characterize, and quantify where appropriate, the current and potential human health and environmental risks that would prevail if no further corrective action is taken.

##### B. Risk Assessment Guidance

The risk assessment must be done in accordance with the guidance, procedures, assumptions, methods, and formats contained in:

EPA Human Health Evaluation Manual Supplemental Guidance 'Standard Default Exposure Factors', OSWER Directive 9285.6-03.

EPA Region I Supplemental Risk Assessment Guidance for the Superfund Program Part 1: Public Health Risk Assessment and Part 2: Ecological Risk Assessment (EPA 901/5/89-001, June 1989).

Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part A) Interim Final (EPA 540/1/-89, December 1989).

Risk Assessment Guidance for Superfund, Volume II: Environmental Evaluation (EPA 540/1-89/001, March 1989).

Air/Superfund National Technical Guidance Study Series, Volumes I, II, III, and IV (EPA 450/1-89-001,002,003,004, July 1989).

Ecological Assessment of Hazardous Waste Sites: A Field and Laboratory Reference Document (EPA 600/3-89/013), March 1989).

Guidance for Data Useability for Risk Assessment, Part A (EPA 9285.7-09A/FS, May 1992).

Additional guidance that may be used to prepare and do the risk assessment are:

Guidelines for:



- a. Carcinogen Risk Assessment (51 FR 33992, September 24, 1986);
- b. Mutagenicity Risk Assessment (51 FR 34006, September 24, 1986);
- c. The Health Risk Assessment of Chemical Mixtures (51 FR 34014, September 24, 1986);
- d. The Health Assessment of Suspect Developmental Toxicants (51 FR 34028, September 24, 1986); and
- e. Exposure Assessment (57 FR 22888).

C. Risk Assessment Methodologies

Components of the Risk Assessment

The Health and Environmental Risk Assessment shall be separated into two components: 1) the human health risk assessment; and 2) the ecological risk assessment. The human health risk assessment must address the following five categories at a minimum:

1. hazard identification;
2. dose-response assessment;
3. exposure assessment;
4. risk characterization; and
5. limitations/uncertainties.

The ecological risk assessment shall address the following seven categories at a minimum:

1. definition of objectives;
2. characterization of site and potential receptors;
3. selection of chemicals, species and endpoints for risk evaluation;
4. exposure assessment;
5. toxicity assessment;
6. risk characterization; and
7. limitations/uncertainties.

#### D. Data Acquisition

The Health and Environmental Risk Assessment shall be based upon information gathered during the RFI at the Site, as well as on data available through peer-reviewed literature. Collection of additional field data to support the Health and Environmental Risk Assessment may be necessary. The decision regarding the need for supplemental data collection will be made after review of the Phase I RFI data by EPA. Primary importance will be placed upon data collected in the field at the Site, with data collected from the literature used to support or explain field results.

#### E. Deliverables

The final product(s) shall be the Health and Environmental Assessment Risk Report(s) comprised of the completed human health and ecological risk assessments. Prior to submission of the final report(s), portions of the Assessment(s) in the form of interim deliverables (as described below) shall be submitted. Once all interim deliverables are accepted the Health and Environmental Risk Assessment Report(s) shall be submitted. This shall include the interim deliverables as well as the additional information required for the report. The HERA is due with the RFI Report. Submit the first interim deliverable with the Phase I Interim RFI Report. Submit the second interim deliverable prior to the RFI Report, as scheduled by Englehard in the Project Management Plan of the RFI Proposal. Provide the schedule for the three HERA deliverables in the Project Management Plan of the RFI Proposal.

##### Interim Deliverables

#### I. First Interim Deliverable

##### A. Human Health Risk Assessment

##### 1. Hazard Identification I

The objective of this component is to present an orderly compilation of the available sampling data on the hazardous substances present at the site, to identify data sets suitable for use in a quantitative risk evaluation, and if necessary, to identify contaminants of concern upon which the quantitative assessment of risk will be based.

This deliverable shall contain information identifying the extent of contamination in each medium. Summaries of the sampling data shall also be generated (see sample table) for each constituent detected in each medium indicating; the mean and maximum concentrations (including location of the latter), the frequency of

detection, identification of the regulatory criteria (MCL/MCLGs), and the number of times the regulatory criteria is exceeded, where appropriate. In addition, pictorial/graphic displays of the data are strongly encouraged. The format of these displays will be dependent upon site specific factors and will be determined with the approval of EPA's risk assessor and project manager.

If the number of contaminants detected is so large that quantification of health risks for each contaminant would be infeasible then contaminants of concern may be selected. Contaminants of concern for each medium shall be identified in accordance with the EPA Region I Supplemental Risk Assessment Guidance for the Superfund Program Part 1: Public Health Risk Assessment. A narrative shall be supplied describing the selection process of contaminants of concern. Important factors in choosing contaminants of concern include contaminant concentration and frequency of detection, potential contaminant releases, potential routes and magnitude of exposure, environmental fate and transport, toxicity and exceedance of promulgated standards.

## 2. Exposure Assessment I

The purpose of this deliverable is to identify all plausible present and potential future exposure pathways and exposure parameters in accordance with the EPA Region I Supplemental Risk Assessment Guidance for the Superfund Program Part 1: Public Health Risk Assessment. Identification of complete exposure pathways include: a source, transport medium, and exposure route. Present and future potential exposures to site contaminants must be identified. (These exposures are closely related to land use. Region I policy dictates the evaluation of a future residential land use unless other scenarios are approved by the Region I office.) Tables or flow charts are useful methods of presenting the possible exposure pathways and are recommended.

Narrative descriptions and summary tables of exposure scenarios shall be provided in this submittal. The exposure scenarios for current and potential future land use shall include, but not be limited to exposure parameters characteristic of a reasonable exposure for the following; frequency and duration of exposure, body weight and the magnitude of exposure to the contaminated medium.

**B. Ecological Risk Assessment**

**1. Hazard Identification I**

This section shall correspond to Section 3.2 of the Ecological Risk Assessment (see requirements for Draft Ecological Assessment below).

**II. Second Interim Deliverable**

**A. Human Health Risk Assessment**

**1. Revised hazard identification**

The Facility shall incorporate any comments received from the Agency on the first deliverable regarding the extent of contamination and the selection of contaminants of concern. In addition, any newly acquired validated data shall be incorporated into this deliverable.

**2. Revised exposure pathways and parameters**

The Facility shall incorporate any comments received from the Agency on the exposure pathways and exposure parameters made on the first deliverable.

**3. Exposure Assessment**

The purpose of the exposure assessment is to estimate a range of possible exposures which may result from actual or threatened releases of hazardous substances from the site. The average and reasonable maximum exposure levels which are to be characterized, are defined by the manner in which the contaminant concentration (average or maximum) is coupled with conservative exposure parameters developed for each exposure scenario per the first deliverable.

The resulting exposure levels (to be referred to as the average and reasonable maximum exposure levels) shall be revised in the draft and/or final risk assessment report, if additional validated data is received. The format of the exposure point concentrations and exposure dose levels shall be presented in narrative form and tables.

**4. Dose-Response Evaluation**

The objective of this component is to identify the nature and probability of adverse health effects which could be expected to result from exposure to

the contaminants of concern. Carcinogenic and noncarcinogenic effects are characterized independently. The dose-response evaluation for possible carcinogenic effects is described by the cancer slope factor (CSF) while for noncarcinogenic effects, the reference dose (RfD) or other suitable health based criteria should be used. Agency verified dose-response criteria obtained from IRIS should preferentially be used.

The Facility shall provide a dose-response evaluation consistent with the EPA Region I Supplemental Risk Assessment Guidance for the Superfund Program Part 1: Public Health Risk Assessment Chapter 3.

5. Risk Characterization

Risk characterization integrates the information developed during the toxicity assessment (hazard identification and dose response evaluation) and the exposure assessment to quantitate the risks from the site for each exposure pathway. Presentation of the risk characterization shall be in the form of tables which separately summarize the noncarcinogenic and carcinogenic health risk. The format for the tables that shall be used are attached.

6. Uncertainties and Limitations

This section shall address the uncertainties and limitations of the analysis. It shall clearly address the major limitations, sources of uncertainty, and if possible, provide an indication as to whether they have resulted in an over- or under-estimation of the risk.

B. Ecological Risk Assessment

1. Revised Hazard Identification

The Facility shall incorporate any comments received from the Agency on the first interim deliverable regarding the selection of contaminants of concern, indicator species and endpoints. In addition, any newly acquired validated data shall be incorporated into this deliverable.

2. Exposure Assessment I

This section shall correspond to Section 4.0 of the Ecological Risk Assessment (see requirements for Draft Ecological Assessment below).

The Facility shall incorporate any comments received from the Agency on the second interim deliverable. In addition, any newly acquired validated data shall be incorporated into this deliverable.

#### E. Health and Environmental Risk Assessment Report

The draft Health and Environmental Risk Assessment document, including the Draft Human Health Risk Assessment and the Draft Ecological Risk Assessment, shall be submitted after the completion and acceptance of two interim deliverables described above. The format of this report shall conform to the chapters and sections as follows:

##### I. Draft Human Health Risk Assessment

###### 1.0 Introduction/Hazard Identification

###### 1.1. Site description and history

1.1.1 Present and future land use

1.1.2. Human receptors (including type, location and numbers)

###### 1.2. Nature and extent of contamination found at site

###### 1.3. Selection of contaminants of concern

1.3.1. Health based Standards (eg MCL/MCLG)

###### 1.4. Fate and transport

###### 2.0 Exposure Assessment

###### 2.1. Exposure pathways

###### 2.2. Exposure scenarios

2.2.1. Exposure point concentrations (ug/l, mg/kg, ug/m<sup>3</sup>)

2.2.2. Exposure dose levels (mg/kg/day)

###### 3.0 Dose Response Evaluation

###### 3.1. Dose response criteria for carcinogenic effects

###### 3.2. Dose response criteria for noncarcinogenic effects

###### 4.0 Risk Characterization

###### 4.1. Narrative and tables summarizing the carcinogenic and noncarcinogenic risks by exposure pathway for the present and potential future exposure scenarios

###### 5.0 Uncertainty/Limitations

6.0 References

7.0 Appendices

7.1. Documentation/data

7.2. Toxicity profiles for contaminants of concern

II. Draft Ecological Risk Assessment

1.0 Introduction

2.0 Objectives

The site-specific objectives of the Ecological Risk Assessment shall be clearly identified. Objectives could include the documentation of an actual or potential endangerment or effects to the environment, the definition of spatial and temporal extent of contamination, development of criteria for remediation, or evaluation of ecological effects of the remedial alternatives.

3.0 Hazard Identification

3.1 Site Characterization

This section shall:

- identify the nature, extent, and sources of contamination through the various exposure pathways of concern.
- describe the topography, hydrology, and other physical, spacial, or other features of ecological interest at and adjoining the site.
- discuss the habitat types and associated species found or expected at or adjacent to the site, or that would otherwise be expected to be affected by contamination from the site.
- highlight any species that are federally endangered or threatened, of special concern to the State, that are Trustee resources, or other species of interest (i.e. of particular economic or social importance).

3.2 Selection of Contaminants of Concern, Indicator Species and Endpoints

This section shall:



- list the contaminants that have been selected. Summarize the criteria for selection of contaminants of concern, and briefly discuss the relationship between each selected compound and the factors considered during selection. Factors to be addressed include, but are not limited to, persistence, bioaccumulation, biomagnification, toxicity, frequency of detection, and concentrations detected and the relationship of these concentrations to a control or "background".
- describe the indicator species and endpoints which have been selected. Discuss the criteria for selection, and how those species and endpoints relate to the criteria. These criteria include but are not limited to the importance and position of the species within the ecosystem, sensitivity, seasonality, relevance to the specific ecosystem found at the site and to human beneficial uses, Trustee or regulatory concerns, and availability of practical methods for prediction and measurement.

#### 4.0 Exposure Assessment

##### 4.1 Source Characterization and Selection of Exposure Pathways

This section shall summarize the source areas of concern and discuss for each area (and, if necessary, by type of contaminants) by indicator species, what exposure pathways will be of concern and considered for further analysis.

##### 4.2 Fate and Transport Analysis

This section shall include site-specific data, applicable models, and information available through the literature.

##### 4.3 Exposure Scenarios and Integrated Exposure Analysis

This section shall determine the exposure scenarios applicable given the selected exposure pathways, contaminants of concern, indicator species, and endpoints. Take into account spatial and temporal variations in exposure, mechanisms of migration, points of exposure, behavioral adaptations, and population characteristics. If a food web or other complex model is to be constructed,



discuss the relationships established between the various species and trophic levels represented in the food web (for example, % of dietary uptake, BCFs, BMFs, duration of exposure).

#### 4.4 Uncertainty Analysis

### 5.0 Toxicity Assessment

#### 5.1 Hazard Identification

This section shall identify the potential toxic endpoints of the contaminants of concern upon the indicator species.

#### 5.2 Quantitative Dose-Response Assessment

This section shall:

- evaluate both literature/laboratory data, as well as site-specific data where available.
- present any applicable benchmark values available for comparison with site conditions. These benchmarks shall include applicable federal and state requirements (where available), sediment quality criteria, equilibrium partitioning values, or other published or peer reviewed values.

#### 5.3 Uncertainty Analysis

### 6.0 Risk Characteristics

#### 6.1 Selection of Risk Assessment Characterization Methodology

#### 6.2 Presentation of Risk Assessment Characterization

This section shall:

- provide narrative and tabular summaries of the risk predictions by exposure pathway and by indicator species; and evaluate both single and multiple chemical effects where applicable. Note specific spacial or temporal distributions if risk is estimated.
- Discuss and quantify (where possible) risks at the community and ecosystem level.

6.3 Uncertainty Analysis

6.4 Conclusions

7.0 References

8.0 Appendices

8.1 Data

8.2 Documentation

8.3 Toxicity Profiles for Contaminants of Concern

Once the draft Health and Environmental Risk Assessment has been reviewed by EPA, a revised draft Risk Assessment document may be warranted. The revised draft document shall follow the same format as the draft report and shall incorporate all comments provided by EPA.